

## VPDES PERMIT FACT SHEET

This document gives the pertinent information concerning the **reissuance** of the VPDES permit listed below. This permit is being processed as a **minor municipal** permit. The effluent limitations contained in this permit will maintain the Water Quality Standards of 9 VAC 25-260-00 et seq.

The discharge results from the operation of a **0.0048 MGD sand filter system** serving a nursing home. Proposed 0.0066 MGD and 0.025 MGD facilities will be integrated fixed film activated sludge (IFAS) systems. This permit action consists revising the total residual chlorine, dissolved oxygen, and ammonia as nitrogen limits and revising special conditions. (SIC Code: 4952)

1. **Facility Name and Address:**

**Woodhaven Nursing Home WWTP**

PO Box 168

Montvale, VA 24122

Location: 13055 West Lynchburg-Salem Turnpike

2. **Permit No:** VA0074870 Existing Permit Expiration Date: May 20, 2008

3. **Owner and Facility Contact:**

Mr. David F. Graves, Owner-Administrator, (540) 947-2207

4. **Application Complete Date:** September 12, 2008

**Permit Drafted By:** Becky L. France

Date: February 22, 2008 (Revised 3/5/08, 3/11/08)

DEQ Regional Office: West Central Regional Office

Reviewed By: Kip D. Foster

Reviewer's Signature: Kip D. Foster Date: 3/14/08

Public Comment Period Dates: From: 3/20/08 To: 4/18/08

5. **Receiving Stream Classification:**

Receiving Stream: South Fork Goose Creek, UT (River Mile: 0.82)

Watershed: VAW-L20R

River Basin: Roanoke River

River Subbasin: Roanoke River

Section: 5a

Class: III

Special Standards: PWS

7-Day, 10-Year Low Flow: 0.27 MGD 7-Day, 10-Year High Flow: 0.33 MGD

1-Day, 10-Year Low Flow: 0.27 MGD 1-Day, 10-Year High Flow: 0.32 MGD

30-Day, 5-Year Low Flow: 0.30 MGD Harmonic Mean Flow: 0.37 MGD

Tidal: No

303(d) Listed: No

See **Attachment A** for a copy of the flow frequency determination memorandum.

6. **Operator License Requirements:** None (0.0048 MGD facility)  
III (0.0066 MGD facility and 0.025 MGD facility)
7. **Reliability Class:** III (0.0048 MGD facility)  
II (0.0066 MGD facility and 0.025 MGD facility)
8. **Permit Characterization:**
- (X) Private      ( ) Interim Limits in Other Document  
( ) Federal      ( ) Possible Interstate Effect  
( ) State  
( ) POTW  
(X) PVOTW
9. **Wastewater Treatment System:** A description of the wastewater treatment system is provided below. See **Attachment B** for the wastewater treatment schematics and **Attachment C** for a copy of the site inspection report. Treatment units associated with the discharge are listed in the table below.

**Table I**  
**DISCHARGE DESCRIPTION**

Outfall Number	Discharge Source	Treatment (Unit by Unit)	Flow (Design)
001	Woodhaven Nursing Home WWTP	Proposed Treatment System Solids retention tank Equalization tank Grinder pumps (2) Pre-classifying filter Oxygenation tank Heater Bioreactor (IFAS) Settling basin Process storage tank Ozone Generator Disk filter Ultrafilter UV light Activated alumina filter UV light Existing Sand Filter System Sand filters (3) Chlorine disinfection Chlorine contact tank Dechlorination	0.0066 and 0.025 MGD 0.0048 MGD

Woodhaven Nursing Home operates an intermittent sand filter system with a design capacity of 0.0048 MGD. The wastewater flows into a septic tank and then into one of three sand filters. Each sand filter has a metal splash plate on the distribution arm that is periodically moved to different locations within the sand filter. The sand is 30 feet deep with underdrains consisting of drain tile piping. The discharge from the sand filter is chlorinated and dechlorinated prior to discharge to an unnamed tributary to the South Fork of Goose Creek.

10. **Sewage Sludge Use or Disposal:** A VPDES Sewage Sludge Permit Application Form was submitted for this facility to address disposal of sewage sludge from the wastewater treatment facility. Primary sludge from the solids retention tank is periodically transported to the Western Virginia Water Authority Water Pollution Control Plant.
11. **Discharge Location Description:** A USGS topographic map which indicates the discharge location, any significant dischargers, any water intakes, and other items of interest is included in **Attachment D**. The latitude and longitude of the discharge is N 37°23'52", E 79°45'8".

Name of Topo: Villamont Number: 109A

12. **Material Storage:** Calcium hypochlorite and sodium sulfite tablets are stored outside in watertight containers.
13. **Ambient Water Quality Information:** Memoranda or other information which helped to develop permit conditions (special water quality studies, STORET data, and any other biological and/or chemical data, etc.) are listed below.

DEQ conducted several flow measurements just upstream of the outfall at Woodhaven Nursing Home. The measurements and the same day daily mean values from a continuous record gauge upstream of the discharge point on Tinker Creek near Daleville, Virginia were plotted on a logarithmic graph and the associated flow frequencies above the discharge point were determined from the graph.

Woodhaven Nursing Home withdraws spring water for the nursing home. The withdrawal occurs about 300 feet upstream from the discharge. It was assumed that the site specific stream measurements were made downstream of the withdrawal, so adjustments in the calculated regression equation outfall values are not needed. **Attachment A** contains a copy of the flow frequency determination memorandum. The flow frequencies for the reference station increased, and therefore the flow frequencies above the outfall significantly increased from the previous reissuance.

Data for STORET Station 4AGSF002.16 were collected upstream of the outfall on the South Fork of Goose Creek at the State Road 607 bridge in the Montvale area. The 90<sup>th</sup> percentile temperature and pH and average hardness used in the wasteload allocation spreadsheets were determined from these STORET station data.

Woodhaven Nursing Home WWTP discharges into the Upper Goose Creek Watershed (VAW-L20R) as described in the 2004 Integrated Report Watershed Assessment Unit Summary (**Attachment E**). The area downstream of this discharge beginning at the confluence with the main stem of Goose Creek has been designated as fully supporting for the aquatic life and swimming uses.

14. **Antidegradation Review and Comments:** Tier I \_\_\_\_\_ Tier II **X** Tier III \_\_\_\_\_

The State Water Control Board's Water Quality Standards includes an antidegradation policy (9 VAC 25-260-30). All state surface waters are provided one of three levels of antidegradation protection. For Tier I or existing use protection, existing uses of the water body and the water quality to protect these uses must be maintained. Tier II water bodies have water quality that is better than the water quality standards. Significant lowering of the water quality of Tier II waters is not allowed without an evaluation of the economic and social impacts. Tier III water bodies are exceptional waters and are so designated by regulatory amendment. The antidegradation policy prohibits new or expanded discharges into exceptional waters.

The antidegradation review begins with Tier determination. Woodhaven Nursing Home WWTP discharges into an unnamed tributary to the South Fork of Goose Creek which is listed as a public water supply in the segment where the discharge is located. The unnamed tributary in this segment (VAW-L20R) is not listed on Part I of the 303(d) list for exceedance of water quality criteria. There are no data that indicate that the water quality exceed in water quality criteria. Therefore, this segment is classified as a Tier II water, and no significant degradation of existing quality is allowed.

For purposes of aquatic life protection in Tier II waters, "significant degradation" means that no more than 25 percent of the difference between the acute and chronic aquatic criteria values and the existing quality (unused assimilative capacity) may be allocated. For purposes of human health protection, "significant degradation" means that no more than 10 percent of the difference between the human health criteria and the existing quality (unused assimilative capacity) may be allocated. The antidegradation baselines for aquatic life and human health are calculated for each pollutant as follows:

$$\text{Antidegradation baseline (aquatic life)} = 0.25 (\text{WQS} - \text{existing quality}) + \text{existing quality}$$

$$\text{Antidegradation baseline (human health)} = 0.10 (\text{WQS} - \text{existing quality}) + \text{existing quality}$$

Where:

"WQS" = Numeric criterion listed in 9 VAC 25-260-00 et seq. for the parameter analyzed

"Existing quality" = Concentration of the parameter being analyzed in the receiving stream

When applied, these "antidegradation baselines" become the new water quality criteria in Tier II waters, and effluent limits must be written to maintain the antidegradation baselines for all pollutants. Antidegradation wasteload allocations calculated in the previous permit reissuance for the different facility design capacities have been revised with updated flow data. The existing background concentration was considered to be zero. Refer to **Attachment F** for

the output from the regional dissolved oxygen model. The model outputs are protective of Tier II waters because the receiving stream will not be depleted more than 0.20 mg/L below the existing baseline conditions.

The permit limits are in compliance with antidegradation requirements set forth in 9 VAC 25-260-30. The antidegradation review was conducted as described in Guidance Memorandum 00-2011, and complies with the antidegradation policy contained in Virginia's Water Quality Standards.

15. **Site Inspection:** Date: 9/19/07                          Performed by: Becky L. France  
**Attachment C** contains a copy of the site inspection memorandum.
16. **Effluent Screening and Limitation Development:** DEQ Guidance Memorandum 00-2011 was used in developing all water quality based limits pursuant to water quality standards (9 VAC 25-260-5 et seq.). Refer to **Attachment G** for effluent data and **Attachment H** for the wasteload allocation spreadsheets and effluent limit calculations. See **Tables II-1 through II-3** on pages 15-17 for a summary of limits and monitoring requirements.

#### A. Mixing Zone

The MIXER program was run to determine the percentage of the receiving stream flow that could be used in the antidegradation wasteload allocation calculations. The program output indicated that 100 percent of the 7Q10 and 1Q10 may be used for calculating acute and chronic antidegradation wasteload allocations (AWLAs) for the 0.0048 MGD, 0.0066 MGD, and 0.025 MGD facilities. A copy of the printouts from the MIXER run are enclosed in **Attachment E**.

#### B. Effluent Limitations for Conventional Pollutants

**Flow** -- The permitted design flow of 0.0048 MGD for this facility is taken from the previous permit and the application for the reissuance. Design flows of 0.0066 MGD and 0.025 MGD represent future upgrades. In accordance with the VPDES Permit Manual, flow is to be estimated and reported daily.

**pH** -- The pH limits of 6.0 S.U. minimum and 9.0 S.U. maximum have been continued from the previous permit. These limits are based upon the water quality criteria in 9 VAC 25-260-50 for Class III receiving waters and are in accordance with federal technology-based guidelines, 40 CFR Part 133, for secondary treatment. Grab samples shall continue to be collected once per day.

**Total Suspended Solids (TSS)** -- TSS are technology-based requirements for municipal dischargers with secondary treatment required in accordance with 40 CFR Part 133. These concentration limits of 30 mg/L monthly average and 45 mg/L maximum weekly average shall continue from the previous permit. In the previous permit the associated loading limits for the 0.0048 MGD, 0.0066 MGD, and 0.025 MGD facilities were given

in kg/d. For the reissuance permit these loadings have been expressed in g/d so that whole numbers can be used. This change is in accordance with Guidance Memorandum 06-2016 which specifies that loading limits should be given in whole numbers. Grab samples shall continue to be collected once per month.

**Biochemical Oxygen Demand ( $BOD_5$ ), Dissolved Oxygen (DO)** -- Since there has been an increase in the flow frequencies at the outfall and a revised effluent temperature, the new data have been entered into the Regional Water Quality Model for Free Flowing Streams (Version 4.10) to reassess the  $BOD_5$  and dissolved oxygen limits. In the previous permit the 90<sup>th</sup> percentile effluent temperature and stream temperature data were determined from data collected downstream of the discharge point on the Roanoke River. For the application, the permittee submitted effluent temperature data for July and August 2007. These data were significantly higher than the data for the Roanoke River. However, the data appeared to be consistent with discharge temperature for similar types of treatment facilities in the area. Therefore, the annual 90<sup>th</sup> percentile effluent temperature and 90<sup>th</sup> stream temperature were calculated from the effluent data collected by the permittee. A copy of the model output results is found in **Attachment F**.

For the existing 0.0048 MGD facility, an initial DO concentration of 0 mg/L, a TKN value of 20 mg/L, and a secondary treatment limit of 30 mg/L for  $BOD_5$  were used in the model input. The model predicted a DO sag at the initial discharge point to 7.087 mg/L. The stream background concentration is 7.213 mg/L. The initial drop of 0.126 mg/L from the baseline is smaller than the 0.20 mg/L drop allowed by antidegradation policy. The regional water quality model output indicates that more stringent limits than the federal secondary treatment guidelines are not necessary for  $BOD_5$  because DO was not predicted to drop below the water quality criteria of 5.0 mg/L or violate antidegradation policy. Additionally, limits are not needed for DO or TKN. The  $BOD_5$  concentration limits for the 0.0048 MGD facility have been continued from the previous permit.

For the 0.0066 MGD facility, an initial DO concentration of 0 mg/L, a TKN value of 20 mg/L, and a secondary treatment limit of 30 mg/L for  $BOD_5$  were used in the model input. The model predicted a DO sag at the initial discharge point to 7.041 mg/L. The initial drop of 0.172 mg/L from the stream background is smaller than the 0.20 mg/L drop allowed by antidegradation policy. Thus, no DO or TKN effluent limitations are needed to prevent degradation of the receiving stream. Secondary treatment limits for  $BOD_5$  are adequate because the dissolved oxygen level is not predicted to drop below 5.0 mg/L or violate antidegradation policy. The  $BOD_5$  concentration limits for the 0.0066 MGD facility have been continued from the previous permit.

For the 0.025 MGD facility, an initial DO concentration of 0 mg/L, a TKN value of 9.9 mg/L, and a secondary treatment limit of 30 mg/L for  $BOD_5$  were used in the model input. The TKN value of 9.9 mg/L was determined by adding 3 mg/L to the ammonia limitation of 6.9 mg/L. The model predicted a DO sag at the initial discharge point to 6.602 mg/L. The initial drop of 0.611 mg/L from the stream background is larger than the 0.2 mg/L drop allowed by antidegradation policy. When the initial DO concentration

was increased to 5.2 mg/L, the model predicted a DO sag concentration of 7.016 mg/L. The initial drop of 0.194 mg/L from the baseline value is smaller than the 0.20 mg/L drop allowed by antidegradation policy. Thus, secondary concentration treatment limits BOD<sub>5</sub> found in the previous permit and a DO limit of 5.2 mg/L will be needed.

In the previous permit the associated loading limits for the 0.0048 MGD, 0.0066 MGD, and 0.025 MGD facilities were given in kg/d. For the reissuance permit these loadings have been expressed in g/d so that whole numbers can be used. This change is in accordance with Guidance Memorandum 06-2016 which specifies that loading limits should be given in whole numbers.

**Attachment G** includes a summary of TKN and ammonia as N data collected from the demonstration project treatment system. These data indicate an average difference between TKN concentration and ammonia as N concentration of 1.410 mg/L. The TKN input for the regional model assumed a corresponding TKN of 9.9 mg/L for an ammonia limit of 6.9 mg/L. Therefore, an ammonia as N limit of 6.9 mg/L will be adequate to prevent exceedances of the TKN value used in the model.

### C. Effluent Limitations for Toxic Pollutants

**Total Residual Chlorine (TRC)** -- The 0.0048 MGD facility uses chlorine as the disinfectant. In case chlorine disinfection is needed for the 0.0066 MGD or 0.025 MGD facilities, alternative chlorine limitations are included in Part I.C. When chlorine is used for disinfection, grab samples are required once per day. In accordance with the current permit guidance, limits are expressed as numerical values even if below the detection limit. The Agency's STATS program was run to reassess permit limits for TRC.

The TRC limits in the previous permit were reassessed with the AWLAs that were determined from the increased stream flow frequencies. Based on the acute and chronic WLAs and the Agency's STATS program, permit limits for the 0.0048 MGD of 0.12 mg/L monthly average and 0.14 mg/L maximum weekly average are needed in the permit. Based on the acute and chronic AWLAs from the Agency's STATS program, permit limits for the 0.0066 MGD facility of 0.087 mg/L monthly average and 0.10 mg/L maximum weekly average have been included in the permit. Based on the acute and chronic AWLAs for the Agency's STATS program, permit limits for the 0.025 MGD facility of 0.023 mg/L monthly average and 0.028 mg/L maximum weekly average have been included in the permit. See **Attachment H** for the AWLA spreadsheets and STATS program outputs for the 0.0048 MGD, 0.0066 MGD, and 0.025 MGD facilities.

The TRC limits for the 0.0048 MGD, 0.066 MGD, and 0.025 MGD facilities are less stringent than the previous permit. In accordance with Section 303(d)(4) of the Clean Water Act, backsliding of water quality based limits is allowed where new information becomes available that was not available at the time the permit limits became effective. Increased stream flow frequencies constitute new information, thus backsliding is allowed.

**Ammonia as N --** Since 90<sup>th</sup> percentile pH, temperature, and stream flow data have changed from the previous reissuance, the ammonia limitations have been reevaluated to determine if less stringent ammonia limits are justified. The 0.0066 MGD and 0.025 MGD facilities have not been built so the limits associated with these facilities are not effective. Since the ammonia limits are not effective, they are not subject to antibacksliding restrictions.

The previous permit did not include ammonia limitation for the 0.0048 MGD facility. To verify that a limit is still not needed for the 0.0048 MGD facility, the acute and chronic antidegradation baseline wasteload allocations were entered into the Agency's STATS program. The STATS program indicated that ammonia limitations are not needed for the 0.0048 MGD facility. For the 0.0066 MGD facility, the program indicated that permit limits are not needed. Therefore, the previous ammonia limits for the 0.0066 MGD facility have not been continued. For the 0.025 MGD facility, the STATS program indicated that permit limits of 6.9 mg/L for monthly average and 6.9 mg/L for maximum weekly average are needed. These limits replace the less stringent ammonia limits for the 0.025 MGD facility found in the 2003 permit. Monitoring for the 0.025 MGD facility shall continue once per month via grab samples.

17. **Basis for Sludge Use and Disposal Requirements:** Since the facility will pump and haul sludge to a POTW, there are no sludge limits or monitoring requirements.
18. **Antibacksliding Statement:** The ammonia limits for the 0.066 MGD and 0.025 MGD facilities are less stringent than the previous permit. The TRC limits for the 0.0048 MGD, 0.066 MGD, and 0.025 MGD facilities are less stringent than the previous permit. In accordance with Section 303(d)(4) of the Clean Water Act, backsliding of water quality based limits is allowed where new information becomes available that was not available at the time the permit limits became effective. Increased stream flow frequencies constitute new information, thus backsliding is allowed. Also, the 0.0066 MGD and 0.025 MGD facilities have not been built, so the limits associated with these facilities were not effective. Thus, the limits for the 0.0066 MGD and 0.025 MGD facilities are not subject to antibacksliding restrictions. No other limitations are less stringent than the previous permit, and the permit limits comply with the antibacksliding requirements of 9 VAC 25-31-220 L of the VPDES Permit Regulation.
19. **Compliance Schedules:** The permit does not contain a compliance schedule.
20. **Special Conditions:** A brief rationale for each special condition contained in the permit is given below.
  - A. **Additional Total Residual Chlorine (TRC) Limitations and Monitoring Requirements – 0.0048 MGD Facility (Part I.B)**

**Rationale:** This condition requires that the permittee monitor the TRC concentration after chlorine contact. In accordance with 40 CFR 122.41 (e), the permittee is required, at all times, to properly operate and maintain all facilities and systems of treatment in order to

comply with the permit. These requirements ensure proper operation of chlorination equipment to maintain adequate disinfection.

**B. Additional TRC Limitations and Monitoring Requirements – 0.0066 MGD Facility and 0.025 MGD Facility (Part I.C)**

Rationale: Should the permittee elect to disinfect by chlorine rather than UV light, this condition establishes TRC concentration limits after chlorine contact and final TRC effluent limits and monitoring requirements. This condition is required by Sewerage Regulations, 9 VAC 25-60-820, and is in accordance with chlorine criteria in 9 VAC 25-260-140 of the VPDES Permit Regulation. Also, 40 CFR 122.41(e) requires the permittee, at all times, to properly operate and maintain all facilities and systems of treatment in order to comply with the permit. These requirements ensure proper operation of chlorination equipment to maintain adequate disinfection.

**C. Compliance Reporting under Part I.A and I.B (Part I.D.1)**

Rationale: In accordance with VPDES Permit Regulation, 9 VAC 25-31-190 J4 and 220 I, DEQ is authorized to establish monitoring methods and procedures to compile and analyze data on water quality, as per 40 CFR Part 130, Water Quality Planning and Management, Subpart 130.4. This condition is necessary when toxic pollutants are monitored by the permittee and a maximum level of quantification and/or specific analytical method is required in order to assess compliance with a permit limit or to compare effluent quality with a numeric criterion. This condition also establishes protocols for calculation of reported values.

**D. 95% Capacity Reopener (Part I.D.2)**

Rationale: This condition requires that the permittee address problems resulting from high influent flows, in a timely fashion, to avoid non-compliance and water quality problems from plant overloading. This requirement is contained in 9 VAC 25-31-200 B2 of the VPDES Permit Regulations.

**E. CTC, CTO Requirement (Part I.D.3)**

Rationale: This condition is required by Code of Virginia § 62.1-44.19; Sewage Collection and Treatment Regulations, 9 VAC 25-790.

**F. O&M Manual Requirement (Part I.D.4)**

Rationale: Submittal of the manual to DEQ for approval is required by VPDES Permit Regulation, 9 VAC 25-31-190 E to provide an opportunity for review of current and proposed operations of the facility.

**G. Licensed Operator Requirement (Part I.D.5)**

Rationale: The VPDES Permit Regulation, 9 VAC 25-31-200 D and the Code of Virginia 54.1-2300 et seq., Rules and Regulations for Waterworks and Wastewater Works Operators, requires licensure of operators. A Class III operator is required for the 0.0066 MGD facility and the 0.025 MGD facility. A licensed operator requirement has not been included for the 0.0048 MGD.

**H. Reliability Class (Part I.D.6)**

Rationale: A Reliability Class III has been assigned to the 0.0048 MGD facility. A Reliability Class II has been assigned to the 0.0066 MGD facility and the 0.025 MGD facility. Reliability class designations are required by Sewage Collection and Treatment Regulations, 9 VAC 25-790-70 for all municipal facilities.

**I. Sludge Reopener (Part I.D.7)**

Rationale: This condition is required by VPDES Permit Regulation, 9 VAC 25-31-220 C for all permits issued to treatment works treating domestic sewage.

**J. Sludge Use and Disposal (Part I.D.8)**

Rationale: VPDES Permit Regulation, 9 VAC 25-31-100 P; 220 B2; and 420 and 720, and 40 CFR Part 503 require all treatment works treating domestic sewage to submit information on sludge use and disposal practices and to meet specified standards for sludge use and disposal. Technical requirements may be derived from the Department of Health's Biosolids Use Regulations, 12 VAC 5-585-10 et seq. This special condition, in accordance with Guidance Memorandum No. 97-004, clarifies that the Sludge Management Plan approved with the issuance of this permit is an enforceable condition of the permit.

**K. Total Maximum Daily Load (TMDL) Reopener (Part I.D.9)**

Rationale: Section 303(d) of the Clean Water Act requires that Total Maximum Daily Loads (TMDLs) be developed for streams listed as impaired. This special condition is to allow the permit to be reopened if necessary to bring it into compliance with any applicable TMDL approved for the receiving stream. The reopener recognizes that, according to Section 402(o)(1) of the Clean Water Act, limits and/or conditions may be either more or less stringent than those contained in this permit. Specifically, they can be relaxed if they are the result of a TMDL, basin plan, or other wasteload allocation prepared under Section 303 of the Act.

**L. Treatment Works Closure Plan (Part I.D.10)**

Rationale: In accordance with State Water Control Law § 62.1-44.19, this condition is used to notify the owner of the need for a closure plan where a treatment works is being replaced or is expected to close.

**M. Conditions Applicable to All VPDES Permits (Part II)**

Rationale: VPDES Permit Regulation, 9 VAC 25-31-190 requires all VPDES permits to contain or specifically cite the conditions listed.

**21. Changes to the Permit:**

**A. The following special condition has been deleted from the permit:**

A Bacterial Effluent Limitations and Monitoring Requirements – 0.0048 MGD Facility Special Condition (Part I.D) has been deleted because the facility has completed the requirements of the bacterial study to submit E. coli data.

**B. Special conditions that have been modified from the previous permit are listed below: (The referenced permit sections are for the new permit.)**

1. The Additional Total Residual Chlorine Limitations and Monitoring Requirements- 0.0048 MGD Facility Special Condition (Part I.B) has been revised to reflect changes in the Water Quality Standards.
2. The Additional Total Residual Chlorine Limitations and Monitoring Requirements- 0.0066 MGD Facility and 0.025 MGD Facility Special Condition (Part I.C) has been revised to reflect changes in the Water Quality Standards.
3. The Operations and Maintenance Manual Special Condition (Part I.D.4) has been revised in accordance with the VPDES Permit Manual.
4. The Licensed Operator Requirement (Part I.D.5) has been revised to remove the requirement for a licensed operator for the 0.0048 MGD facility because the facility no longer operates the pilot project and the sand filter system does not require a licensed operator.

**C. New special conditions added to the permit are listed below:**

1. The CTC, CTO Requirement (Part I.D.3) has been added in accordance with the VPDES Permit Manual. In accordance with the Sewage Collection and Treatment Regulations, plans and specifications are to be submitted to the DEQ for review and approval to construct.

2. A Total Maximum Daily Load (TMDL) Reopener Special Condition has been added as Part I.D.9 to allow opening of the permit if necessary to comply with any applicable TMDL for the receiving stream.
- D. **Permit Limits and Monitoring Requirements:** See Table III on pages 18-19 for details on changes to the effluent limits and monitoring requirements.
22. **Variances/Alternate Limits or Conditions:** No variances or alternate limits or conditions are included in this permit. For the application, the permittee requested a waiver to allow the submission of E. coli data collected during the permit term in lieu of fecal coliform data. The permittee also requested that grab analysis data for TSS and BOD<sub>5</sub> collected during the permit term be used in the application in lieu of composite samples. These waivers were consistent with current permit requirements, and therefore they were granted.
23. **Regulation of Treatment Works Users (9 VAC 25-31-280 B9):** VPDES Permit Regulation 9 VAC 25-31-280 B9 requires that every permit issued to a treatment works owned by a person other than a state or municipality provide an explanation of the Board's decision on the regulation of users. There are no industrial users contributing to the treatment works.
24. **Public Notice Information required by 9 VAC 25-31-290 D:**

All pertinent information is on file and may be inspected, and arrangements made for copying by contacting Becky L. France at:

Virginia DEQ, West Central Regional Office  
3019 Peters Creek Road  
Roanoke, VA 24019  
540-562-6700  
[blfrance@deq.virginia.gov](mailto:blfrance@deq.virginia.gov)

Persons may comment in writing or by e-mail to the DEQ on the proposed permit action and may request a public hearing during the comment period. Comments shall include the name, address, and telephone number of the writer, and shall contain a complete, concise statement of the factual basis for comments. Only those comments received within this period will be considered. The DEQ may decide to hold a public hearing if public response is significant. Requests for public hearings shall state the reason why a hearing is requested, the nature of the issues proposed to be raised in the public hearing, and a brief explanation of how the requester's interests would be directly and adversely affected by the proposed permit action.

Following the comment period, the DEQ will make a determination regarding the proposed permit action. This determination will become effective, unless the DEQ grants a public hearing. Due notice of any public hearing will be given.

25. **303(d) Listed Segments (TMDL):** This facility discharges directly to an unnamed tributary to the South Fork of Goose Creek. The stream segment receiving the effluent is not listed on the 303(d) list; and therefore no Total Maximum Daily Loads (TMDLs) have been or are being developed for this segment.

26. **Additional Comments:**

A. **Reduced Effluent Monitoring:** Guidance Memorandum 98-2005 allows for reduced monitoring at facilities with excellent compliance histories. To qualify for consideration of reduced monitoring, the facility should not have been issued any Letter of Noncompliance (LON), Notice of Violation (NOV), or Warning Letter, or be under any Consent Orders, Consent Decrees, Executive Compliance Agreements, or related enforcement documents during the past three years.

The facility received the following Notice of Violation (NOV) reports within the past three years:

NOV No. W2007-11-W-1018	failure to notify of flow 95% of design capacity
NOV No. W2007-01-W-0003	operating pilot wastewater treatment system after CTO certification expired
Warning Letter No. W2005-08-W-1013	contract lab REIC's laboratory deficiencies
NOV No. W2005-07-W-0002	deficient E. coli demonstration study progress report
NOV No. W2004-10-W-0004	BOD <sub>5</sub> exceedances, late DMRs

The facility does not meet the criteria discussed above, and therefore is not eligible for reduced monitoring.

B. **Previous Board Action:** None

C. **Staff Comments:** The discharge is not controversial. The discharge is in conformance with the existing planning document for the area.

D. **Public Comments:** (to be determined)

E. **Tables:**

Table I	Discharge Description (Page 2)
Table II	Basis for Monitoring Requirements (Page 15-17)
Table III	Permit Processing Change Sheet (Pages 18-19)

**F. Attachments**

- A. Flow Frequency Information
- B. Wastewater Process Information
  - Wastewater Schematics
  - Process Description
- C. Site Inspection Report
- D. USGS Topographic Map
- E. Ambient Water Quality Information
  - Mixing Zone Calculations (MIXER 2.1)
  - STORET Data (Station 4AGSF002.16)
  - 2004 Integrated Report Watershed Assessment Unit Summary (Excerpt)
- F. Regional Dissolved Oxygen Model Outputs (Version 4.10)
  - Map of Model Segments and Drainage Areas
  - 0.0048 MGD Facility
    - Regional Model Calculations
    - Regional Model Input Summary
    - Model Output ( $BOD_5=30\text{ mg/L}$ ,  $TKN=20\text{ mg/L}$ ,  $DO=0\text{ mg/L}$ )
  - 0.0066 MGD Facility
    - Regional Model Calculations
    - Regional Model Input Summary
    - Model Output ( $BOD_5=30\text{ mg/L}$ ,  $TKN=20\text{ mg/L}$ ,  $DO=0\text{ mg/L}$ )
  - 0.025 MGD Facility
    - Regional Model Calculations
    - Regional Model Input Summary
    - Model Outputs ( $BOD_5=30\text{ mg/L}$ ,  $TKN=9.9\text{ mg/L}$ ,  $DO=0\text{ mg/L}$ )  
( $BOD_5=30\text{ mg/L}$ ,  $TRN=9.9\text{ mg/L}$ ,  $DO=5.2\text{ mg/L}$ )
- G. Effluent Data
- H. Wasteload and Limit Calculations
  - 0.00048 MGD Facility
    - Wasteload Allocation Spreadsheet
    - STATS Program Results (TRC, Ammonia)
  - 0.0066 MGD Facility
    - Wasteload Allocation Spreadsheet
    - STATS Program Results (TRC, Ammonia)
  - 0.025 MGD Facility
    - Wasteload Allocation Spreadsheet
    - STATS Program Results (TRC, Ammonia)
- I. Public Notice
- J. EPA Checksheet

**Table II-1**  
**BASIS FOR LIMITATIONS – MUNICIPAL**

( ) Interim Limitations  
(x) Final Limitations

OUTFALL: 001  
DESIGN CAPACITY: 0.0048 MGD  
Effective Dates - From: Effective Date  
To: Expiration Date or 0.0066 MGD

PARAMETER	BASIS FOR LIMITS	DISCHARGE LIMITS			MONITORING REQUIREMENTS		
		Monthly Average	Weekly Average	Minimum	Maximum	Frequency	Sample Type
Flow (MGD)	NA	NL	NA	NA	NL	1/Day	Estimate
pH (Standard Units)	1,2	NA	NA	6.0	9.0	1/Day	Grab
BOD <sub>5</sub>	1	30 mg/L 500 g/d	45 mg/L 800 g/d	NA	NA	1/Month	Grab
Total Suspended Solids	1	30 mg/L 500 g/d	45 mg/L 800 g/d	NA	NA	1/Month	Grab
Total Residual Chlorine	2	0.12 mg/L	0.14 mg/L	NA	NA	1/Day	Grab

NA = Not Applicable

NL = No Limitations; monitoring only

The basis for the limitations codes are:

1. Federal Technology-Based Secondary Treatment Regulation (40 CFR Part 133)
2. Water Quality Criteria
3. Regional Water Quality Model

**Table II-2**  
**BASIS FOR LIMITATIONS – MUNICIPAL**

( ) Interim Limitations  
(x) Final Limitations  
OUTFALL: 001  
DESIGN CAPACITY: 0.0066 MGD  
Effective Dates - From: Upgrade to 0.0066 MGD  
To: Expiration Date or Upgrade to 0.025 MGD

PARAMETER	BASIS FOR LIMITS	DISCHARGE LIMITS			MONITORING REQUIREMENTS	
		Monthly Average	Weekly Average	Minimum	Maximum	Frequency
Flow (MGD)	NA	NL	NA	NA	NL	1/Day
pH (Standard Units)	1,2	NA	NA	6.0	9.0	Estimate
BOD <sub>s</sub>	1	30 mg/L 700 g/d	45 mg/L 1100 g/d	NA	NA	Grab
Total Suspended Solids	1	30 mg/L 700 g/d	45 mg/L 1100 g/d	NA	NA	1/Month
E. coli (N/100 ml) (Geometric Mean)	2	126	NA	NA	NA	1/Week

NA = Not Applicable

NL = No Limitations; monitoring only

The basis for the limitations codes are:

1. Federal Technology-Based Secondary Treatment Regulation (40 CFR Part 133)
2. Water Quality Criteria
3. Regional Water Quality Model

**Table II-3**  
**BASIS FOR LIMITATIONS – MUNICIPAL**

PARAMETER	BASIS FOR LIMITS	DISCHARGE LIMITS		MONITORING REQUIREMENTS	
		Monthly Average	Weekly Average	Maximum	Frequency
Flow (MGD)	NA	NL	NA	NA	1/Day
pH (Standard Units)	1,2	NA	NA	6.0	9.0
BOD <sub>5</sub>	1	30 mg/L 2800 g/d	45 mg/L 4300 g/d	NA	1/Day
Total Suspended Solids	1	30 mg/L 2800 g/d	45 mg/L 4300 g/d	NA	1/Month
Dissolved Oxygen	3	NA	NA	5.2 mg/L	1/Day
Ammonia as Nitrogen	2	6.9 mg/L	6.9 mg/L	NA	1/Month
E. coli (N/100 ml) (Geometric Mean)	2	126	NA	NA	1/Week

NA = Not Applicable

NL = No Limitations; monitoring only

The basis for the limitations codes are:

1. Federal Technology-Based Secondary Treatment Regulation (40 CFR Part 133)
2. Water Quality Criteria
3. Regional Water Quality Model

**Table III**  
**PERMIT PROCESSING CHANGE SHEET**

**LIMITS AND MONITORING SCHEDULE:**

Outfall No.	Parameter Changed	Monitoring Requirement Changed		Effluent Limits Changed		Reason for Change	Date
		From	To	From	To		
001	Total Residual Chlorine (TRC)			0.0048 MGD Facility- 0.10 mg/L as hourly average concentration	0.0048 MGD Facility- 0.12 mg/L monthly average & 0.14 mg/L maximum weekly average	New antidegradation wasteload allocations due to increase in stream flow frequencies. STATS program output indicated that less stringent limit needed.	3/11/08
001	Total Residual Chlorine (TRC)			0.0066 MGD Facility- 0.038 mg/L monthly average & 0.045 mg/L maximum weekly average	0.0066 MGD Facility- 0.087 mg/L monthly average & 0.10 mg/L maximum weekly average	New antidegradation wasteload allocations due to increase in stream flow frequencies. STATS program output indicated that less stringent limit needed.	3/11/08
001	Total Residual Chlorine (TRC)			0.025 MGD Facility- 0.010 mg/L monthly average & 0.012 mg/L maximum weekly average	0.025 MGD Facility- 0.023 mg/L monthly average & 0.028 mg/L maximum weekly average	New antidegradation wasteload allocations due to increase in stream flow frequencies. STATS program output indicated less stringent limit needed.	3/11/08
001	Ammonia as Nitrogen			0.0066 MGD Facility - 16.7 mg/L	0.0066 MGD Facility - NA	New antidegradation wasteload allocations due to increase in stream flow frequencies. STATS program output indicated no limit needed.	3/11/08
001	Ammonia as Nitrogen			0.025 MGD Facility - 4.3 mg/L	0.025 MGD Facility - 6.9 mg/L monthly average	New antidegradation wasteload allocations due to increase in stream flow frequencies. STATS program output indicated less stringent limit needed.	3/11/08
001	Dissolved Oxygen			0.025 MGD Facility - 5.0 mg/L minimum	0.025 MGD Facility - 5.2 mg/L minimum	Given revised stream flow and effluent temperature, the regional water quality model indicated the need for a more stringent limit.	3/11/08

**Table III-2**  
**PERMIT PROCESSING CHANGE SHEET**

**LIMITS AND MONITORING SCHEDULE:**

Outfall No.	Parameter Changed	Monitoring Requirement Changed		Effluent Limits Changed		Reason for Change	Date
		From	To	From	To		
001	BOD <sub>5</sub> and TSS (0.0048 MGD)	30 mg/L (0.5 kg/d) monthly average and 40 mg/L (0.8 kg/d) maximum weekly average	30 mg/L (500 g/d) monthly average and 40 mg/L (800 g/d) maximum weekly average	The loading limits were rewritten in whole numbers as g/d in accordance with Guidance Memorandum 06-2016 which specifies that loading limits should be listed in whole numbers.	3/3/08		
001	BOD <sub>5</sub> and TSS (0.0066 MGD)	30 mg/L (0.7 kg/d) monthly average and 40 mg/L (1.1 kg/d) maximum weekly average	30 mg/L (700 g/d) monthly average and 40 mg/L (1100 g/d) maximum weekly average	The loading limits were rewritten in whole numbers as g/d in accordance with Guidance Memorandum 06-2016 which specifies that loading limits should be listed in whole numbers.	3/3/08		
001	BOD <sub>5</sub> and TSS (0.025 MGD)	30 mg/L (2.8 kg/d) monthly average and 40 mg/L (4.3 kg/d) maximum weekly average	30 mg/L (2800 g/d) monthly average and 40 mg/L (4300 g/d) maximum weekly average	The loading limits were rewritten in whole numbers as g/d in accordance with Guidance Memorandum 06-2016 which specifies that loading limits should be listed in whole numbers.	3/3/08		

**Attachment A**

**Flow Frequency Information**

## MEMORANDUM

DEPARTMENT OF ENVIRONMENTAL QUALITY - WATER DIVISION  
3019 Peters Creek Road Roanoke, Virginia 24019

---

**SUBJECT:** Flow Frequency Determination  
Woodhaven Nursing Home WWTP, VA0074870

**TO:** Permit File

**FROM:** Becky L. France, Environmental Engineer Senior *fjf*

**DATE:** January 24, 2008

This memorandum supersedes the November 3, 1997 memorandum from Paul E. Herman concerning the subject VPDES permit.

Woodhaven Nursing Home WWTP discharges to the South Fork Goose Creek Tributary No. 1 near Villamont, Virginia. Stream flow frequencies are required at this site to develop effluent limitations for the VPDES permit.

The DEQ conducted several flow measurements on the South Fork Goose Creek Tributary No. 1 from 1996 to 1999. The measurements were made just upstream from the nursing home outfall. The measurements correlated very well with the same day daily mean values from the continuous record gauge on Tinker Creek near Daleville, Virginia #02055100. The measurements and daily mean values were plotted on a logarithmic graph and a best fit line was drawn through the data points. The required flow frequencies from the reference gauge were plugged into the equation for the regression line and the associated flow frequencies at the discharge point were calculated. The high flow months are January through May. Flow frequencies for the reference gauge, the measurement site, and the discharge point are listed on the attached tables.

Woodhaven Nursing Home withdraws water for use by the facility from a spring located approximately 300 feet upstream of the discharge point. It is assumed that the site specific stream measurements were made downstream of the withdrawal, so adjustments in the calculated regression equation outfall values are not needed.

Flow Frequency Determination Memorandum  
Woodhaven Nursing Home WWTP (VA0074870)  
Page 3 of 3

Reference Gauge (data from 1956 to 2003)  
Tinker Creek near Daleville, VA (#02055100)

Drainage Area [ mi <sup>2</sup> ] =		11.7	mi <sup>2</sup>	
ft <sup>3</sup> /s	MGD		ft <sup>3</sup> /s	MGD
1Q10 =	0.96	0.62	High Flow 1Q10 =	2.3
7Q10 =	1	0.65	High Flow 7Q10 =	2.6
30Q5 =	1.6	1.03	High Flow 30Q10=	3.2
30Q10=	1.2	0.78	HM =	5
				3.23

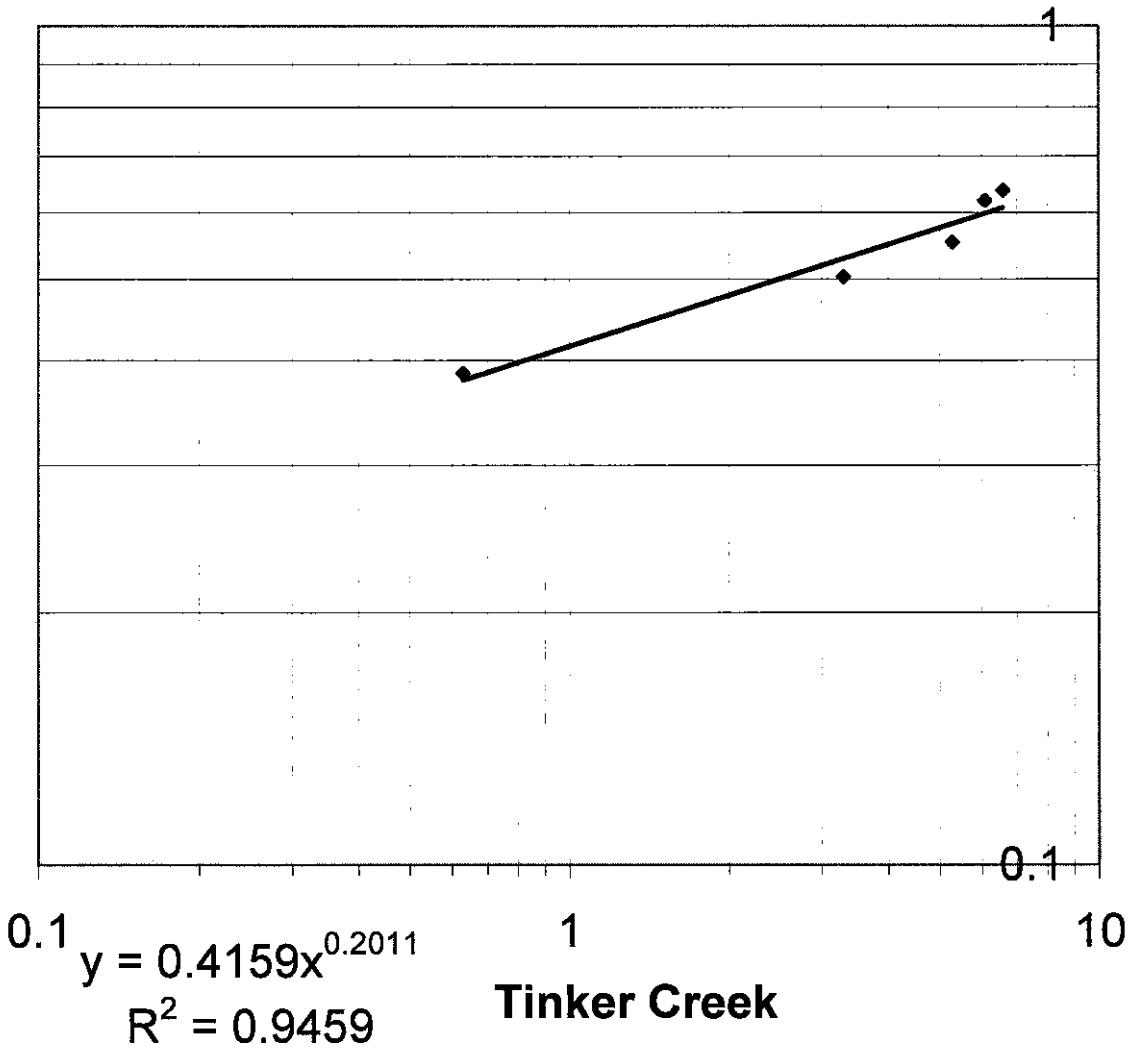
Flow frequencies from Regression Analysis

S.F. Goose Creek Trib No.1 above Woodhaven near Villamont, VA  
(#02059440)

Drainage Area [ mi <sup>2</sup> ] =		0.31	mi <sup>2</sup>	
ft <sup>3</sup> /s	MGD		ft <sup>3</sup> /s	MGD
1Q10 =	0.41	0.27	High Flow 1Q10 =	0.49
7Q10 =	0.42	0.27	High Flow 7Q10 =	0.50
30Q5 =	0.46	0.30	High Flow 30Q10	0.53
30Q10=	0.43	0.28	HM =	0.57
				0.37

S. F. Goose Creek Trib No. 1 above Woodhaven Nursing Home near Villamont, VA (#02059440)  
 vs Tinker Creek near Daleville, VA (#02055100)

**S. F. Goose Creek Tributary**



<u>Flow Data (cfs)</u>			<u>Flow Frequencies (cfs)</u>		
Date	Tinker	SF Goose	Tinker	SF Goose	
7/10/1996	5.3	0.553	<u><a href="#">SUMMARY OUTPUT</a></u>	0.96	1Q10 0.412
8/21/1996	6.1	0.62		1.0	7Q10 0.416
5/21/1997	6.6	0.637	<u><a href="#">Regression Statistics</a></u>	1.6	30Q5 0.457
10/24/1997	3.3	0.503	Multiple R 0.99034893	1.2	30Q10 0.431
8/12/1999	0.63	0.386	R Square 0.980791	2.3	HF 1Q10 0.492
			Adjusted R Square 0.974388	2.6	HF 7Q10 0.504
			Standard Error 0.01621497	5.0	HM 0.575
				3.2	HF30Q10 0.526
				11.7 mi <sup>2</sup>	DA 0.31 mi <sup>2</sup>
			Observations 5		Jan-May

South Fork Goose Creek Trib No. 1 above Woodhaven Nursing Home near Villamont #02059440  
 vs Tinker Creek near Daleville #02055100

#### SUMMARY OUTPUT

<i>Regression Statistics</i>	
Multiple R	0.990348929
R Square	0.980791001
Adjusted R Square	0.974388001
Standard Error	0.016214965
Observations	5

#### ANOVA

	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	1	0.040274025	0.040274	153.1768	0.001136495
Residual	3	0.000788775	0.000263		
Total	4	0.0410628			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
Intercept	0.359987311	0.016237774	22.16974	0.000201	0.308311418	0.4116632	0.308311418	0.4116632
X Variable 1	0.040996965	0.003312495	12.37646	0.001136	0.030455118	0.05153881	0.030455118	0.05153881

#### RESIDUAL OUTPUT

<i>Observation</i>	<i>Predicted Y</i>	<i>Residuals</i>
1	0.577271226	-0.024271226
2	0.610068798	0.009931202
3	0.630567281	0.006432719
4	0.495277296	0.007722704
5	0.385815399	0.000184601

Lat 37 23'52", Long 79 45'07"

S. F. Goose Creek Trib No. 1, near Villamont, VA  
Drainage Area 0.31 mi<sup>2</sup>

DEQ Station No.	Date	Flow cfs
02059440	7/10/1996	0.553
02059440	8/21/1996	0.62
02059440	5/21/1997	0.637
02059440	10/24/1997	0.503
02059440	8/12/1999	0.386

Tinker Creek near Daleville, VA  
Drainage Area 11.7 mi<sup>2</sup>

USGS Station No.	Date	Mean Flow cfs
02055100	7/10/1996	5
02055100	8/21/1996	0.62
02055100	5/21/1997	0.637
02055100	10/24/1997	0.503
02055100	8/12/1999	0.386

Gauging Station #02055100  
Tinker Creek near Daleville, VA

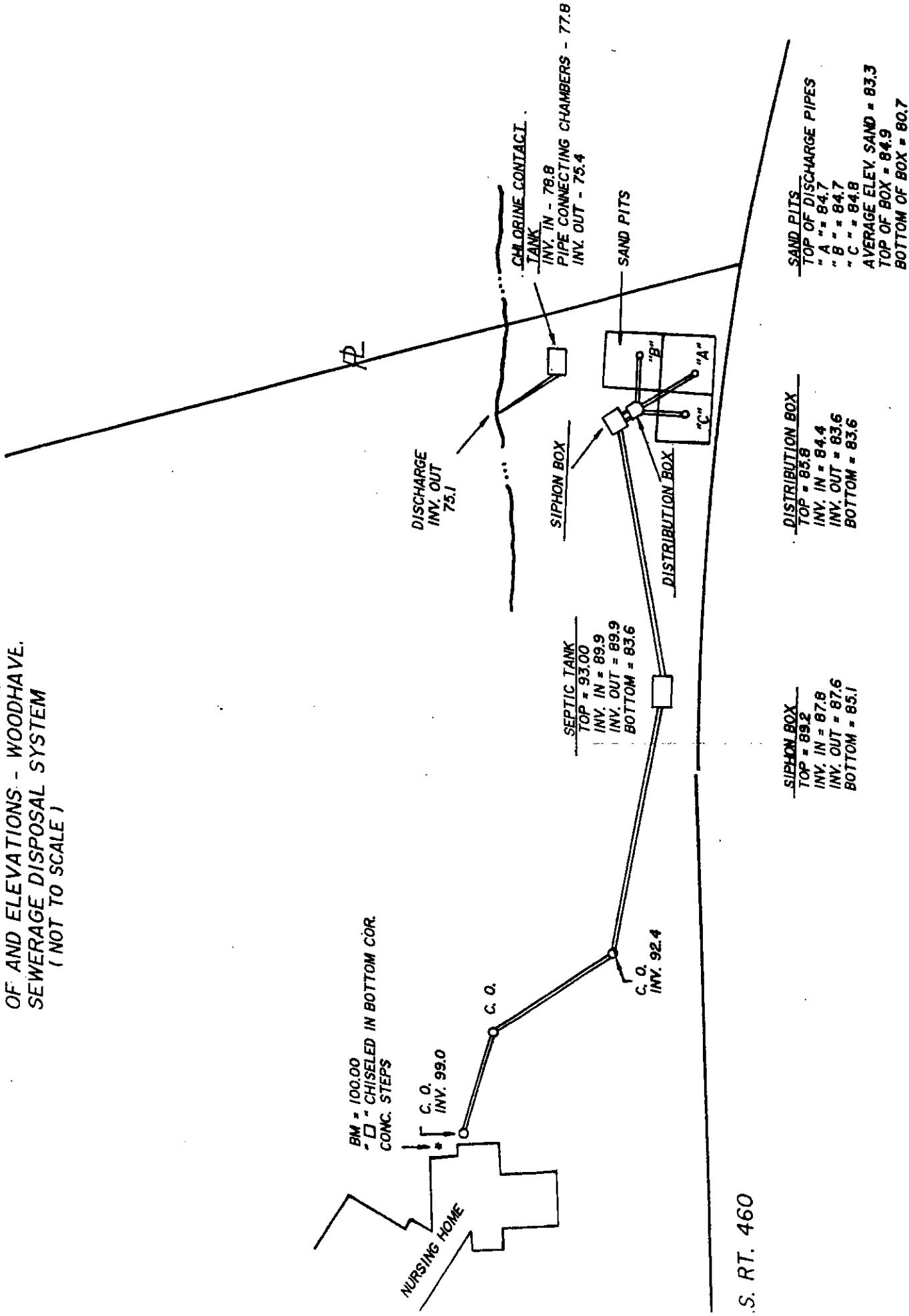
RECORD	DAAREA	HARMAN	HE30010	HE7010	HE1010	HE3005	HE3010	HE3016	HE3030	HEMIS	STATPERIOD	YRSTRN	
R 1956-	11.7	50	3.2	2.6	2.3	16	12	10	0.96	0.65	JAN-MAY	1956-2003	2005

## **Attachment B**

### **Wastewater Process Information**

- Wastewater Schematics**
- Process Description**

**SKETCH SHOWING LOCATIONS  
OF AND ELEVATIONS - WOODHAVE  
SEWERAGE DISPOSAL SYSTEM  
(NOT TO SCALE)**

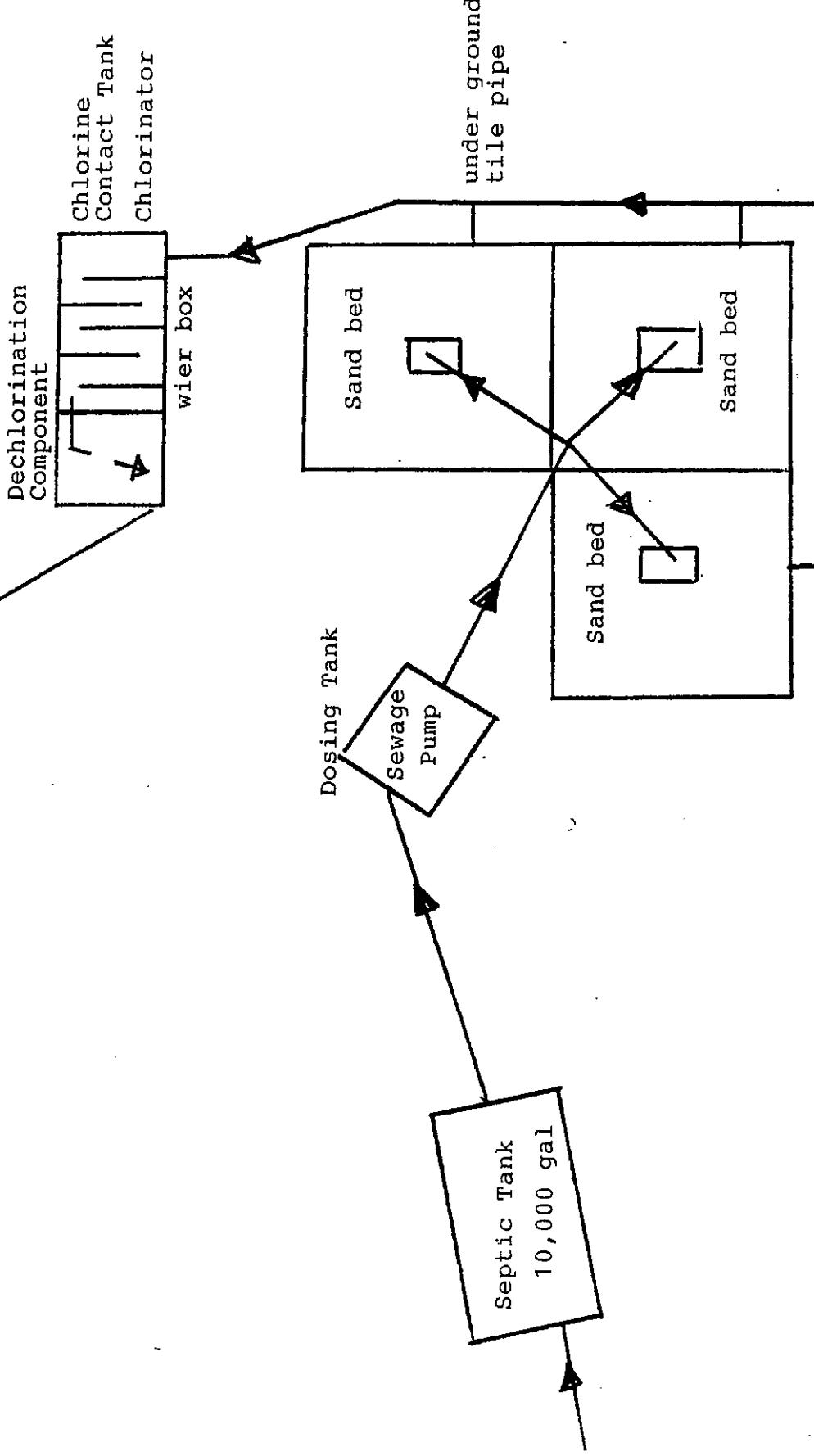


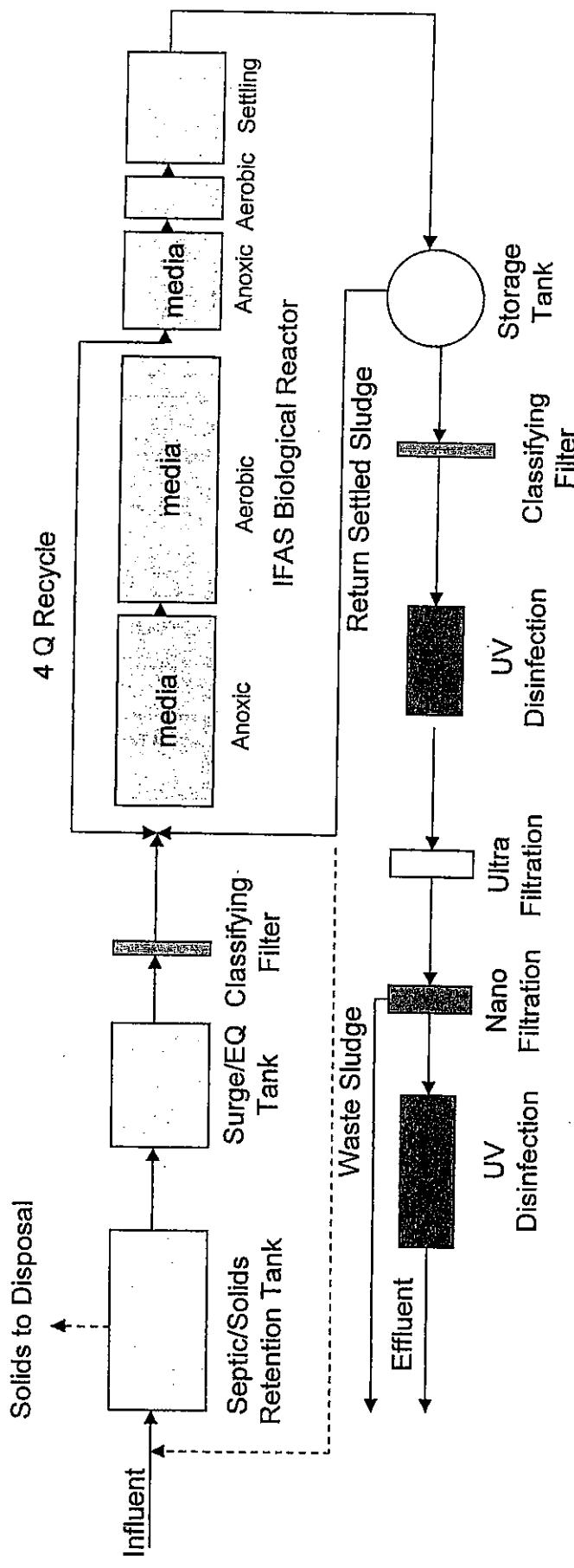
**A1**

WOODHAVEN NURSING HOME  
SEWAGE TREATMENT PLANT  
FLOW SCHEME

(not to scale)

Effluent





**Schematic Diagram of the Wastewater Conversion Technologies, Inc.  
On-Site Wastewater Treatment Process**

## DESIGN PROCESS

The entire treatment system is enclosed, eliminating access for vectors to any part of the treatment train. Other than the Septic/Solids Retention Tank and the Surge/EQ tank, the treatment system is housed in a temperature controlled steel structure. Those components contained in this structure are buried below ground.

The treatment system contains no dewatering equipment. All settled biomass solids and all reject solids from the filters are recycled back to the septic/solids retention tank where they undergo anaerobic digestion. These collected solids are monitored via a specialized level transducer which tracks the volume of solids. When the solids level increases to a point that might cause carryover, they are pumped out and transported to a disposal plant or municipal wastewater treatment plant that accepts septage. All solids will be removed from the Septic/Solids Retention Tank using a vacuum septage truck and sent to appropriate disposal.

For a brief description, the raw wastewater enters the two-compartment Septic/Solids Retention Tank where the settleable solids are settled to the sludge blanket and the oil, grease and other floatables collect in a layer on the surface. The first compartment of the tank is  $\frac{2}{3}$ rds of the tank volume and is separated from the second compartment by a baffle wall that extends above the water surface and has an opening for forward flow located below at the mid liquid depth point. The effluent from the tank overflows without equalization, and then flows to a Surge/EQ tank where the flow is equalized. The equalization tank is maintained at 10% capacity, this allows a 90% reserve for flow irregularities and equipment maintenance problems. Total capacity is based on 24 to 36 hours total flow. Two redundant grinder pumps take the flow and pass it through a 120 micron pre-classification filter. The filter prevents the passage of large solids such as plastics, etc., to protect subsequent pumps and prevent any clogging of the media in the Biological Reactor. The filtered wastewater is then run through a thermostatically set heated so the Bioreactors can always be maintained at a temperature that will ensure efficient nitrification and denitrification. The Bioreactor is a Modified Bardenpho configuration biological nutrient removal process that contains plastic media similar to Kaldnes media, which has a specific surface area of 153 ft<sup>2</sup>/ft<sup>3</sup> (500 m<sup>2</sup>/m<sup>3</sup>), so that all but the anaerobic zone and the last aerobic zone operate as Integrated Fixed-Film Activated Sludge (IFAS) reactors. This system is capable of performing Enhanced Biological Phosphorus Removal (EBPR), but typically will be operated only for enhanced nitrification and denitrification. Enhanced nitrification and denitrification are accomplished by the biofilms that grow on the IFAS media. The settling basin is an integral part of the Bioreactor, and its primary function is to settle the bulk of the mixed liquor biomass and recycle it to the influent of the Bioreactor, i.e. the anaerobic zone. The settling basin overflow goes to the Process Storage Tank where it is stored to minimize flow variations between the Bioreactors, and final filtration /polishing units. Solids in the process storage tank are collected with a 20 micron disk filter. When the filter is back-flushed, solids are sent back to the Bioreactors. When the Mixed Liquor Suspended Solids (MLSS) level needs to be lowered, a WAS valve is opened and these solids are sent to the solids retention tank. After the Disk Filter, the treated flow enters the 150,000 Dalton MWCO Ultrafilter, which removes any TSS that is remaining in the flow. The ultrafiltration membranes are NSF and SWTR approved by exhibiting over a Log 5 removal efficiency for bacteria and viruses, and reducing turbidity levels to < 0.06 NTU. Next the flow enters the first of two UV radiation units for disinfection/sterilization. This stage destroys fecal coliform, pathogens and retards microbial growth on the Activated Alumina columns. Each UV unit is rated at a minimum of 90,000

mw/cm<sup>2</sup> usually two to three times the required state regulation. There are three phosphorus removing Activated Alumina columns, but only two operate at a time so that the flow goes from the most saturated column to the least saturated column. This process maximizes utilization of the phosphorus removing capacity of the first column before it is taken off line for regeneration. This process also ensures that the effluent phosphorus concentration from the third column is below the breakthrough concentration, i.e. the effluent requirement. As the breakthrough concentration wave nears the end of the second column, the third or fresh column becomes the second column. Then the previous second column becomes the first column and the third column becomes the second. This cycling is continued. After the Activated Alumina columns, the treated flow is treated again by UV disinfection to assure that the effluent will contain no fecal coliforms or pathogens, and it is discharged for final disposal.

**Attachment C**

**Site Inspection Report**

M E M O R A N D U M

DEPARTMENT OF ENVIRONMENTAL QUALITY  
*West Central Regional Office*

3019 Peters Creek Road

Roanoke, VA 24019

SUBJECT: Site Inspection Report for Woodhaven Nursing Home WWTP  
Reissuance of VPDES Permit No. VA0074870

TO: Permit File

FROM: Becky L. France, Environmental Engineer Senior *BLF*

CC: Samuel C. Hale, Environmental Inspector Supervisor

DATE: September 27, 2007

On September 19, 2007, a site inspection of the wastewater works for Woodhaven Nursing Home was conducted. Woodhaven Nursing Home is located off US 460 in the Villamont area of Bedford County. Drinking water is withdrawn from a spring upstream from the outfall to the treatment plant. Mr. David Graves, owner, and Mr. Larry Irving, operator trainee, were present at the site inspection. According to Mr. Graves, there are plans for a 40 unit assisted living facility addition which will include an additional 60 residents and 20 staff. This facility will result in a projected 20,000 gpd wastewater treatment design facility.

The treatment works consists of septic tank, dosing tank, three sand filters, tablet chlorinator, and tablet dechlorinator. A diagram of the treatment system is attached. There is a grease trap for the kitchen area which is checked once every other month. Wastewater from the nursing home flows into a 5,500 gallon septic tank and then into a 10,000 gallon tank. The septic tank is pumped about every 5 to 6 months and the septage hauled to the Western Virginia Water Authority WPCP. The wastewater flows from the septic tank via gravity into a dosing tank. From the dosing tank the wastewater is routed to one of three sand filters. Each sand filter has three distribution pipes. Any solids skimmed from the surface of the sand filter are sent to the Bedford County Landfill.

At the time of the site visit, the wastewater was grey in color and had a moderate sewage odor in the area of the sand filter. There was no sign of vegetation in any of the sand filter beds. It was observed that the distribution system did not evenly apply flow to the sand filter currently in use (sand filter A). Only one of the three pipes was distributing flow onto the filter and there was ponding. There was some leakage at the manually controlled three way valve for the sand filter distribution system and the wastewater was flowing through an overflow pipe into sand filter B. Repairs appear to be needed to the distribution system to evenly apply wastewater across the filter.

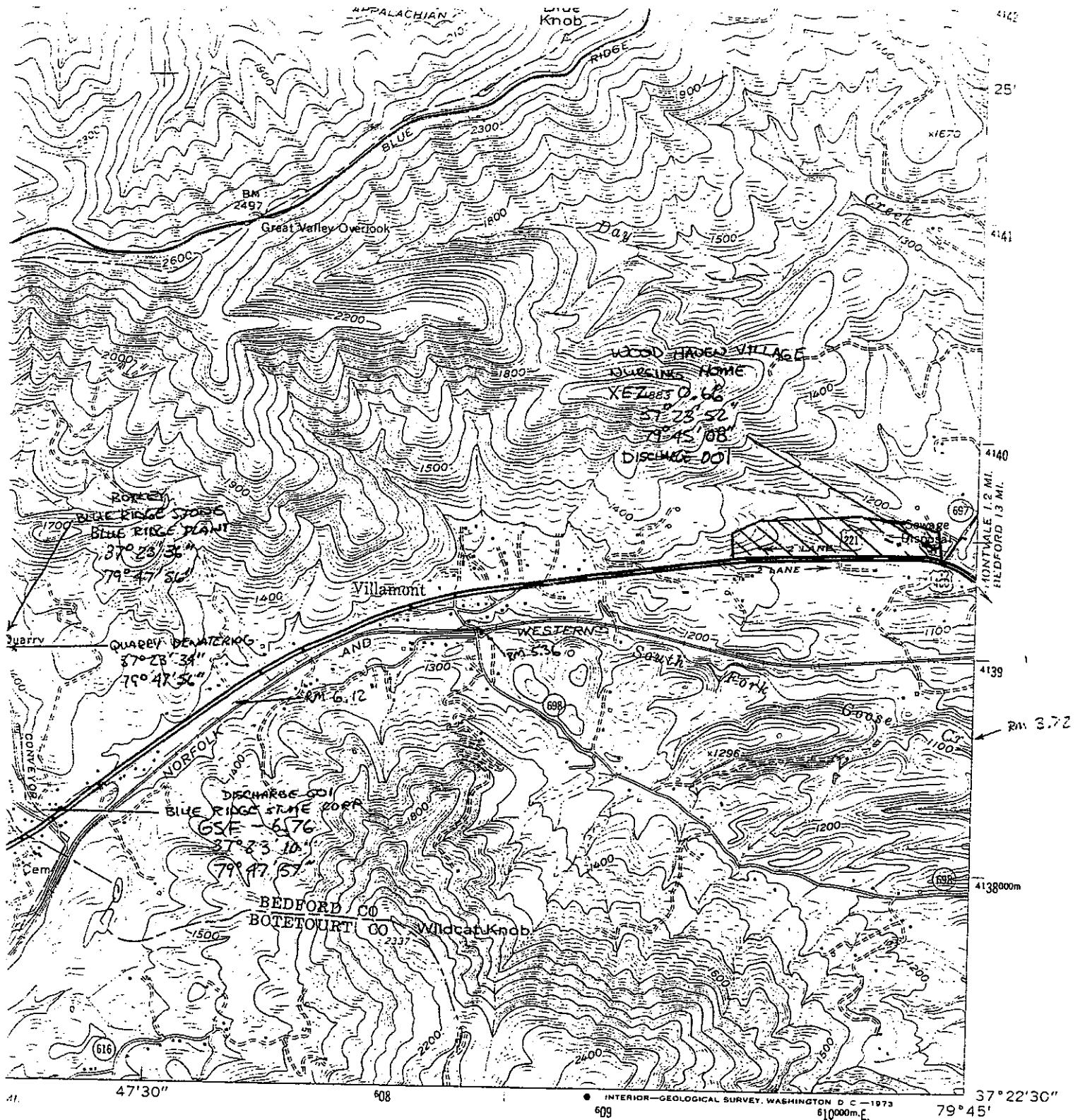
Due to these problems, the flow was manually shifted to sand filter B. All three pipes were distributing flow onto sand filter B. However, the leakage at the three way valve continued and there was some leakage from the valve to the distribution nozzle areas.

Chlorination and dechlorination tablets are stored in sealed pails in the disinfection unit. There was a screen to keep leaves out of the contact tank. At the time of the site visit, there was a discharge which appeared to be somewhat cloudy. There was flow in the receiving stream which was approximately 5 feet wide.

Total residual chlorine (TRC) and pH are tested onsite. Effluent wastewater flow is estimated from water use records. Total Suspended Solids (TSS) and BOD<sub>5</sub> testing are performed by a contract laboratory.

**Attachment D**

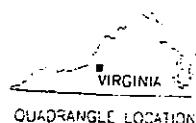
**USGS Topographic Map**



1 MILE  
3 FEET  
CR

ROAD CLASSIFICATION

Heavy-duty	—	Light-duty	—
Medium-duty	—	Unimproved dirt	-----
Interstate Route		U. S. Route	
State Route			



A 22903  
EST

Revisions shown in purple compiled in cooperation with Commonwealth of Virginia agencies from aerial photographs taken 1972. This information not field checked

VILLAMONT, VA.

N3722.5—W7945/7.5  
1963  
PHOTOREVISED 1972  
AMS 5058 IV NE—SERIES V834

## **Attachment E**

### **Ambient Water Quality Information**

- **Mixing Zone Calculations (MIXER 2.1)**
- **STORET Data (Station 4AGSF002.16)**
- **2004 Integrated Report Watershed Assessment Unit Summary (Excerpt)**

## Mixing Zone Predictions for

## Woodhaven Nursing Home WWTP

Effluent Flow = 0.048 MGD

Stream 7Q10 = 0.27 MGD

Stream 30Q10 = 0.28 MGD

Stream 1Q10 = 0.27 MGD

Stream slope = 0.025 ft/ft

Stream width = 2.644 ft

Bottom scale = 2

Channel scale = 1

---

### Mixing Zone Predictions @ 7Q10

Depth = .2016 ft

Length = 31.74 ft

Velocity = .922 ft/sec

Residence Time = .0004 days

#### Recommendation:

A complete mix assumption is appropriate for this situation and the entire 7Q10 may be used.

---

### Mixing Zone Predictions @ 30Q10

Depth = .2059 ft

Length = 31.1 ft

Velocity = .9324 ft/sec

Residence Time = .0004 days

#### Recommendation:

A complete mix assumption is appropriate for this situation and the entire 30Q10 may be used.

---

### Mixing Zone Predictions @ 1Q10

Depth = .2016 ft

Length = 31.74 ft

Velocity = .922 ft/sec

Residence Time = .0096 hours

#### Recommendation:

A complete mix assumption is appropriate for this situation and the entire 1Q10 may be used.

---

## Mixing Zone Predictions for

## Woodhaven Nursing Home WWTP

Effluent Flow = 0.0066 MGD  
Stream 7Q10 = 0.27 MGD  
Stream 30Q10 = 0.28 MGD  
Stream 1Q10 = 0.27 MGD  
Stream slope = 0.025 ft/ft  
Stream width = 2.661 ft  
Bottom scale = 2  
Channel scale = 1

---

### Mixing Zone Predictions @ 7Q10

Depth = .1835 ft  
Length = 35.11 ft  
Velocity = .8742 ft/sec  
Residence Time = .0005 days

Recommendation:

A complete mix assumption is appropriate for this situation and the entire 7Q10 may be used.

---

### Mixing Zone Predictions @ 30Q10

Depth = .1882 ft  
Length = 34.25 ft  
Velocity = .8857 ft/sec  
Residence Time = .0004 days

Recommendation:

A complete mix assumption is appropriate for this situation and the entire 30Q10 may be used.

---

### Mixing Zone Predictions @ 1Q10

Depth = .1835 ft  
Length = 35.11 ft  
Velocity = .8742 ft/sec  
Residence Time = .0112 hours

Recommendation:

A complete mix assumption is appropriate for this situation and the entire 1Q10 may be used.

---

## Mixing Zone Predictions for

## Woodhaven Nursing Home WWTP

Effluent Flow = 0.025 MGD

Stream 7Q10 = 0.27 MGD

Stream 30Q10 = 0.28 MGD

Stream 1Q10 = 0.27 MGD

Stream slope = 0.025 ft/ft

Stream width = 2.736 ft

Bottom scale = 2

Channel scale = 1

---

### Mixing Zone Predictions @ 7Q10

Depth = .1881 ft

Length = 36.29 ft

Velocity = .8872 ft/sec

Residence Time = .0005 days

#### Recommendation:

A complete mix assumption is appropriate for this situation and the entire 7Q10 may be used.

---

### Mixing Zone Predictions @ 30Q10

Depth = .1921 ft

Length = 35.6 ft

Velocity = .8982 ft/sec

Residence Time = .0005 days

#### Recommendation:

A complete mix assumption is appropriate for this situation and the entire 30Q10 may be used.

---

### Mixing Zone Predictions @ 1Q10

Depth = .1881 ft

Length = 36.29 ft

Velocity = .8872 ft/sec

Residence Time = .0114 hours

#### Recommendation:

A complete mix assumption is appropriate for this situation and the entire 1Q10 may be used.

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**STORET Station 4AGSF002.16**  
**South Fork Goose Creek**

Collection Date Time	Temp Celsius	Field pH (S.U.)	BOD <sub>5</sub> (mg/l)	Ammonia Total (mg/l as N)	Nitrate, Total (MG/L AS N)	Hardness (mg/l as CaCO <sub>3</sub> )	Fecal Coliform (MFM-FCBR/100 ml)
1/31/1984 9:15	2.5	7.8	2	<0.1			
2/16/1984 9:30	7	7.4	2	0.2	0.38		
3/5/1984 9:00	5.2	7.4	1	<0.1	0.07		
4/12/1984 8:45	8.8	7	1	<0.1	0.6		
5/16/1984 9:30	11	7.4	1	<0.1	0.4		
6/14/1984 9:40	19.3	7.1	2	<0.1			
7/23/1984 8:45	18	6.9	2	<0.1	0.4		
8/13/1984 9:00	19	6.6	1	<0.1	<0.4		
9/4/1984 9:30	18	7.5	1	<0.1	0.6		
10/31/1984 10:10	14.7	7.4	1	<0.1	0.42		
1/16/1985 9:30	1	6.7	2	<0.1	0.6		<100
2/14/1985 10:00	0	7.3	1	<0.1	0.48		<100
1/7/1985 0:00	10.8	7.9	1	<0.1	0.22		<100
4/8/1985 8:35	6	7.9	2	<0.1	0.29		100
5/13/1985 8:20	14.8	7.5	1	<0.1	0.28		800
6/17/1985 13:30	20	7.9	<1	<0.1	0.32		300
7/11/1985 8:30	17	7.2	1	<0.1	0.31		300
8/5/1985 14:45	20	8.2	<1				200
9/12/1985 9:00	16.1	7.2	<1				<100
10/15/1985 13:30	19.3	8.1	1	<0.1	0.19		<100
11/19/1985 10:00	14	7.15	1	<0.1	0.49		100
12/11/1985 8:30	5.5	7.5	2	<0.1	0.4		100
1/13/1986 8:15	2.7	7.7	1	<0.1	0.49		300
2/5/1986 9:15		7.8	1	<0.1	0.33		100
3/5/1986 9:30	3.8	7.6	1	<0.1	0.51		<100
4/3/1986 8:45	11.3	7.6	1	<0.1	0.25		200
5/15/1986 9:10	13	7.6	1	<0.1	0.3	146	300
6/16/1986 9:00	18.5	7.8	<1	<0.1	0.25	147	1100
7/2/1986 14:30	20.8	8.1	1	<0.1	0.38	154	1300
8/4/1986 13:20	23	8.2	1	<0.1	0.29	170	<100
9/2/1986 15:50	16.2	7.6	1	<0.1	0.55	180	100
10/14/1986 9:25	15.8	7.2	3	<0.1	0.34	134	900
11/13/1986 12:45	8.8	7.9	<1	<0.1	0.45	162	200
12/10/1986 9:30	9.7	7.2	1	<0.1	1.48	185	300
1/15/1987 8:20	6.5	7.5	<1	<0.1	1	162	100
2/5/1987 8:30	3.2	6.9	1	<0.1	0.5	112	100
3/10/1987 10:00	5	7	1	0.1	0.54	112	<100
4/8/1987 9:30	8.1	7.3	1	<0.1	0.34	108	<100
5/5/1987 9:00	11.5	7.73	2	<0.1	0.88	137	100
6/2/1987 9:30	19.5	7.78	1	<0.1	0.29	98	
7/20/1987 9:00	19.3	7.9	<1	<0.1	0.26	134	<100
8/3/1987 8:50	20.5	7.8	2	<0.1	0.17	150	800
9/1/1987 10:05	18.4	7.8	1	<0.1	0.23	172	100
10/1/1987 10:00	13.8	7.6	1	0.1	0.29	158	100

**STORET Station 4AGSF002.16**  
**South Fork Goose Creek**

<b>Collection Date Time</b>	<b>Temp Celsius</b>	<b>Field pH (S.U.)</b>	<b>BOD<sub>s</sub> (mg/l)</b>	<b>Ammonia Total (mg/l as N)</b>	<b>Nitrate, Total (MG/L AS N)</b>	<b>Hardness (mg/l as CaCO<sub>3</sub>)</b>	<b>Fecal Coliform (MFM- FCBR/100 ml)</b>
11/4/1987 9:30	15.3	8.4	<1	<0.1	0.12	135	100 **
12/2/1987 9:00	6.2	9	<1	<0.1	0.55	132	700 **
1/5/1988 9:30	4.1	8.5	1	<0.1	0.38	156	<100 **
3/2/1988 13:00	7.5	8	1	<0.04	0.79	140	100 **
5/2/1988 8:40	11.9	7.3	1	<0.04	0.25	120	<100 **
6/8/1988 8:45	17.8	8.3	1	0.06	0.96	156	<100 **

All fecal coliform sampling data collected 5 minutes following other STORET data if listed at same time.

90th Percentile Temperature	19.6 °C	Jan-Dec.
90th Percentile Temperature	11.9 °C	Jan.-May (wet season)
90th Percentile pH	8.2 S.U.	
10th Percentile pH	7.0 S.U.	
Mean Hardness	144 mg/L	

# 2004 Integrated Report Watershed Assessment Unit Summary

Watershed ID: **VAW-L20R**      UPPER GOOSE CREEK

Assessment Unit (AU)	TMDL ID	Overall AU Category	Stream & AU Description	AU Size
VAW-L20R_DAY01A00		2A	Day Creek mainstem from Rt. 741 downstream to its mouth on the North Fork Goose Creek.	0.59 MILES
VAW-L20R_DAY02A00		2A	Day Creek mainstem perennial headwaters downstream to the Rt. 741 crossing.	5.10 MILES
VAW-L20R_GNE01A04		2A	N.F. Goose Creek mainstem from 2.62 miles upstream of its confluence with the S.F. Goose Creek.	2.62 MILES
VAW-L20R_GSE01A00	VAW-L20R-01	5A	Goose Creek mainstem from the North and South Fork confluence downstream to the Bore Auger Creek mouth.	6.79 MILES
VAW-L20R_GSF01A04		2A	South Fork Goose Creek from its confluence with North Fork Goose Creek upstream 3.16 miles upstream of Montvale (37°23'19" / 79°44'39").	3.16 MILES
VAW-L20R_ZZZ01A00		3A	Remaining waters in watershed L20R.	118.75 MILES

**VAW-L20R**

## **OVERALL 2004 WATERSHED SUMMARY**

Total Watershed Size:

137.01 MILES

UPPER GOOSE CREEK

**Total Assessment Units:**

**6**

### Federal Category 5 Waters

### Federal Categories 4A & 4C Waters

Waters 'Impaired' requiring TMDL Studies

No further TMDL Study required

'Impaired' for one or more parameters	Believed Natural	One TMDL complete one or more remains	Waters 'Impaired' TMDL complete	Waters 'Impaired' Natural
---------------------------------------	------------------	---------------------------------------	---------------------------------	---------------------------

(VA Subcategories)

**5A**

**5C**

**5D**

**4A**

**4C**

Impaired Waters:

6.79

### Federal Category 3 Waters

Existing Data Insufficient to Assess	<u>non-DEQ Data Method Collection and/or Laboratory not QA/QC'd</u>		
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No Data

Assess

Use Not Attained  
'Waters of Concern'

Use Attained

(VA Subcategories)

**3A**

**3B**

**3C**

**3D**

Insufficient Data:

118.75

### Federal Category 2 Waters

Fully Supports Assessed Uses	Fully Supports but are 'Waters of Concern'
------------------------------	--

(VA Subcategories)

**2A**

**2B**

Support Some Uses:

11.47

### Federal Category 1 Waters

'Fully Supports all Uses'

(VA Subcategories)  
Supports All Uses:

**1**

\* Note: Totals are based on Overall AU Category.

# **2004 Use Attainment by Assessment Units (AU)**

**Watershed ID: VAW-L20R**

**Total Watershed Size: 137.01 M**

**AU ID: VAW-L20R\_ZZZ01A00 118.75 M**

**AU Overall Category: 3A**

**LOCATION:** Remaining waters in watershed L20R.

<b>State TMDL ID</b>	<b>Use</b>	<b>WOS Attainment</b>	<b>303(d) Impairment Initial List Year</b>
	Aquatic Life	Not Assessed	
	Fish Consumption	Not Assessed	
	Public Water Supply	Not Assessed	
	Recreation	Not Assessed	
	Wildlife	Not Assessed	

WQS Class III Sec. 5a PWS No current data. These waters are not assessed. No VDH fish consumption or drinking water advisories.

**AU ID: VAW-L20R\_GSF01A04 3.16 M**

**AU Overall Category: 2A**

**LOCATION:** South Fork Goose Creek from its confluence with North Fork Goose Creek upstream 3.16 miles upstream of Montvale ( $37^{\circ}23'19''$  /  $79^{\circ}44'39''$ ).

<b>State TMDL ID</b>	<b>Use</b>	<b>WOS Attainment</b>	<b>303(d) Impairment Initial List Year</b>
	Aquatic Life	Fully Supporting	
	Fish Consumption	Fully Supporting	
	Public Water Supply	Fully Supporting	
	Recreation	Not Assessed	
	Wildlife	Fully Supporting	

WQS Class III Sec. 5a PWS

Assessment basis: DEQ station 4AGSF002.60 (AQ) and 4AGSF002.16 ('02 FT/Sed). Stream Flow Conditions [9 VAC 25-260-50 Numerical criteria for dissolved oxygen, pH and maximum temperature\*\*\*]. Total field measurements 1 at 4AGSF002.60. Daily Mean Flow; 02055100 Tinker Cr. - Daleville <7Q10 of 1.2 cfs @ gage on 6/25/02 (0.63 cfs). Field measurement set excluded from the dataset- each Full Support. 4AGSE002.60- Water column metals and NH3-N Fully Support. Single observations of DO, Temp and pH do not exceed but are not assessed. 4AGSE002.16- WQS 2002 fish tissue and sediment collections do not exceed the WQS TVs or TSVs. However lead (Pb) is detected in a Bluehead Chub at 0.21 ppm. Sediment collection finds no excursions of the PEC SVs. No VDH fish consumption or drinking water advisories.

**AU ID: VAW-L20R\_GSE01A00 6.79 M**

**AU Overall Category: 5A**

**LOCATION:** Goose Creek mainstem from the North and South Fork confluence downstream to the Bore Auger Creek mouth.

<b>State TMDL ID</b>	<b>Use</b>	<b>WOS Attainment</b>	<b>303(d) Impairment Initial List Year</b>
	Aquatic Life	Fully Supporting	
	Fish Consumption	Not Assessed	
	Public Water Supply	Fully Supporting	
VAW-L20R-01	Recreation	Not Supporting	
	303(d) Parameter: Total Fecal Coliform		2004
	Wildlife	Fully Supporting	

WQS Class III Sec. 5a PWS

Assessment basis: DEQ station 4AGSE037.78 Stream Flow Conditions [9 VAC 25-260-50 Numerical criteria for dissolved oxygen, pH and maximum temperature\*\*\*]. Total field measurements 18 at 4AGSE037.78. Daily Mean Flow; 02059500 Goose Cr. - Huddleston <7Q10 of 22 cfs @ gage on 8/19/99 (10 cfs). Single Fully Supporting field measurement set excluded from the dataset. 4AGSE037.78- FC exceeds in three of 18 samples. Each exceedance, 500, 700 and 4800 cfu/100 ml, is in excess of the 400 cfu/100 ml instantaneous criterion. DO, Temp, pH, TP and NH3-N all Fully Support. AQ sediment collections find no excursions of the PEC SVs. No VDH fish consumption or drinking water advisories.

# ***2004 Use Attainment by Assessment Units (AU)***

**AU ID:** **VAW-L20R\_GNE01A04**

**2.62 M**

**AU Overall Category: 2A**

**LOCATION:** N.F. Goose Creek mainstem from 2.62 miles upstream of its confluence with the S.F. Goose Creek.

<b>State TMDL ID</b>	<b>Use</b>	<b>WOS Attainment</b>	<b>303(d) Impairment Initial List Year</b>
	Aquatic Life	Fully Supporting	
	Fish Consumption	Not Assessed	
	Public Water Supply	Not Assessed	
	Recreation	Not Assessed	
	Wildlife	Not Assessed	

WQS Class III Sec. 5a PWS

Assessment basis: DEQ station 4AGNE000.16 ('99 Sed only). 4AGSE000.16- 1999 WQS sediment collection for PCB finds no excursions of the PEC SV of 676 ppb. No VDH fish consumption or drinking water advisories.

**AU ID:** **VAW-L20R\_DAY02A00**

**5.10 M**

**AU Overall Category: 2A**

**LOCATION:** Day Creek mainstem perennial headwaters downstream to the Rt. 741 crossing.

<b>State TMDL ID</b>	<b>Use</b>	<b>WOS Attainment</b>	<b>303(d) Impairment Initial List Year</b>
	Aquatic Life	Fully Supporting	
	Fish Consumption	Not Assessed	
	Public Water Supply	Not Assessed	
	Recreation	Not Assessed	
	Wildlife	Not Assessed	

WQS Class V Sec. 5a PWS

Assessment basis: DEQ station 4ADAY003.97 (RBPII) 4ADAY003.97- Bio 'NI'; not impaired. Single RBP II 2002 survey scoring 100. This station was surveyed to determine if it could serve as a reference site for 1st and 2nd order Blue Ridge ecoregion streams in Bedford and Franklin Counties. The physical/chemical conditions and habitat quality at this site were optimal for benthic macroinvertebrate colonization. However, the benthic community appeared to have been affected by the recent drought, having low taxonomic diversity as well as low density of total individuals relative to samples collected at other sites with the same amount of effort. Single observations of DO, Temp, and pH although Fully Supporting are not assessed. No VDH fish consumption or drinking water advisories.

**AU ID:** **VAW-L20R\_DAY01A00**

**0.59 M**

**AU Overall Category: 2A**

**LOCATION:** Day Creek mainstem from Rt. 741 downstream to its mouth on the North Fork Goose Creek.

<b>State TMDL ID</b>	<b>Use</b>	<b>WOS Attainment</b>	<b>303(d) Impairment Initial List Year</b>
	Aquatic Life	Fully Supporting	
	Fish Consumption	Not Assessed	
	Public Water Supply	Not Assessed	
	Recreation	Not Assessed	
	Wildlife	Not Assessed	

WQS Class III Sec. 5a PWS

Assessment basis: DEQ station 4ADAY003.97 (RBPII) 4ADAY003.97- Bio 'NI'; not impaired. Single RBP II 2002 survey scoring 100. This station was surveyed to determine if it could serve as a reference site for 1st and 2nd order Blue Ridge ecoregion streams in Bedford and Franklin Counties. The physical/chemical conditions and habitat quality at this site were optimal for benthic macroinvertebrate colonization. However, the benthic community appeared to have been affected by the recent drought, having low taxonomic diversity as well as low density of total individuals relative to samples collected at other sites with the same amount of effort. Single observations of DO, Temp, and pH although Fully Supporting are not assessed. No VDH fish consumption or drinking water advisories.

## **Attachment F**

### **Regional Dissolved Oxygen Model Output (Version 4.10)**

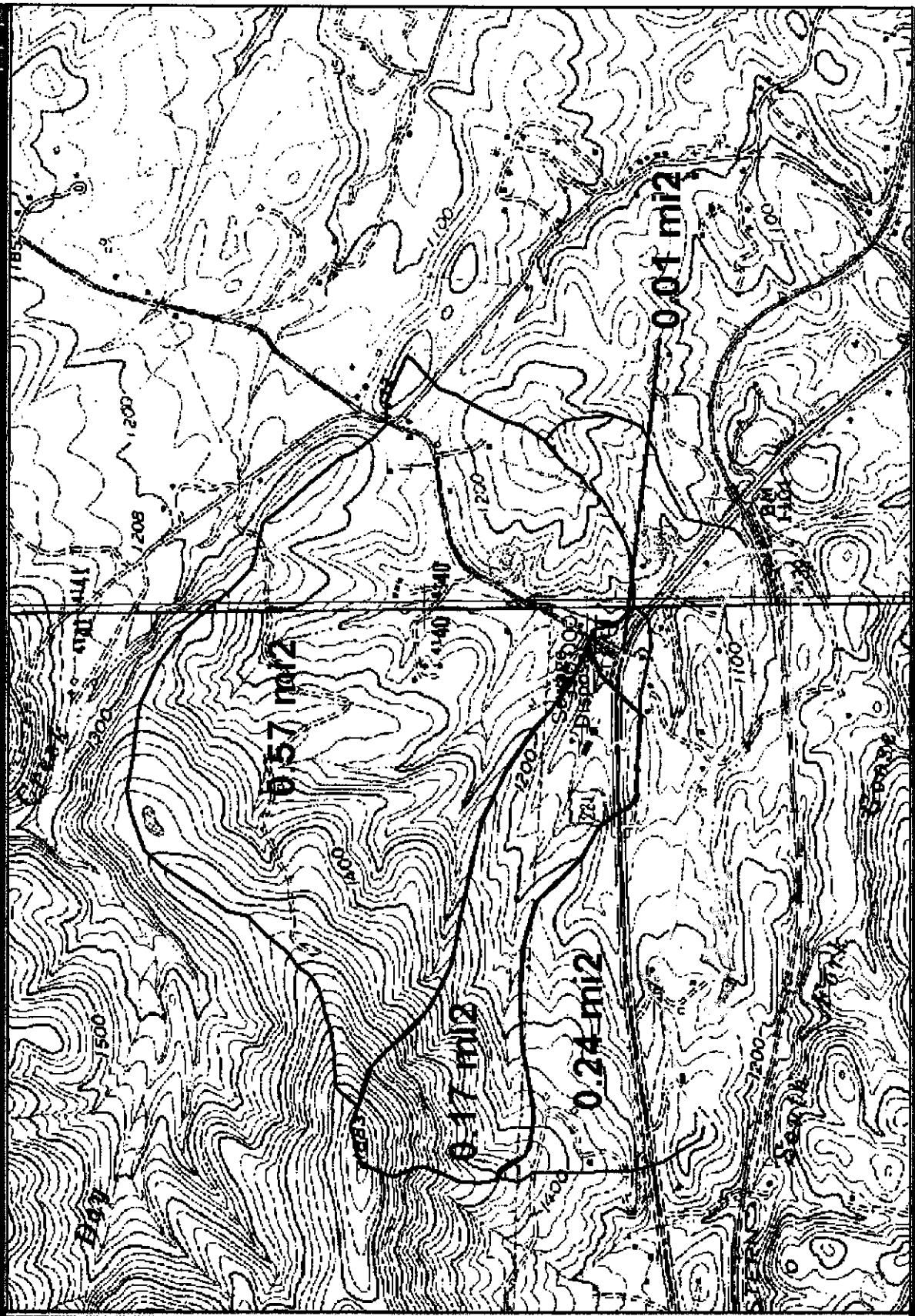
- **Map of Model Segments and Drainage Areas**
- **0.0048 MGD Facility**
  - Regional Model Calculations
  - Regional Model Input Summary
  - Model Output (BOD<sub>5</sub>=25 mg/L, TKN=20 mg/L, DO=0 mg/L)
- **0.0066 MGD Facility**
  - Regional Model Calculations
  - Regional Model Input Summary
  - Model Output (BOD<sub>5</sub>=25 mg/L, TKN=20 mg/L, DO=0 mg/L)
- **0.025 MGD Facility**
  - Regional Model Calculations
  - Regional Model Input Summary
  - Model Outputs (BOD<sub>5</sub>=25 mg/L, TKN=8.2 mg/L, DO=0 mg/L)  
(BOD<sub>5</sub>=25 mg/L, TKN=8.2 mg/L, DO=5.1 mg/L)

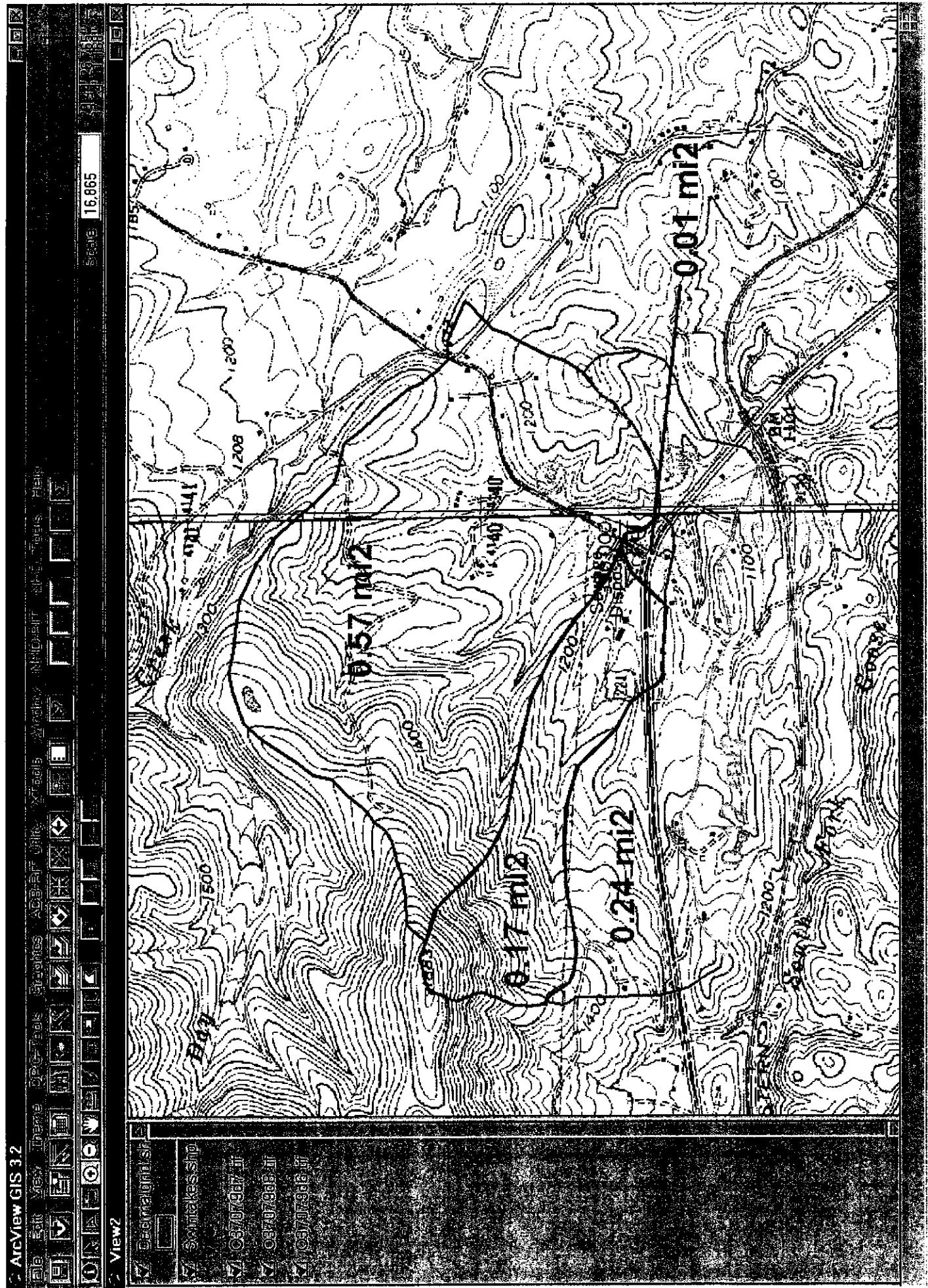
图例

图例

图例

16.865





**0.0048 MGD Facility**

# Regional DO Model Calculations

**South Fork Goose Creek, UT**  
Segment 1

Rectangular

Velocity and area calculations to use in table.

		7Q10	
Manning n	Slope	Effluent Flow MGD	Stream Flow MGD
0.05	0.025	0.0048	0.27

Stream characteristics at 7Q10 conditions calculated in table.		
Depth (ft)	Width (ft)	Velocity (ft/s)
0.14	2.644	1.174

Manning Equation

$$V(\text{fps}) = (1.486/n) * R_h^{(2/3)} * S^{0.5}$$

Rectangular  
 $R_h = d * w / (2d + w)$

Rectangular Surface Area =  $d * w$

Continuity Equation

$$V = Q/A$$

Roughness Coefficient		
Factors	n	+
sand bottom	0.05	
silt bottom	0.07	
gravel bottom	0.09	
small rock	0.11	
large rock	0.15	
boulders	0.18	
modest meander		$n+0.02$
severe meander	0.00	$n+0.04$
light plants		$n+0.03$
heavy plants		$n+0.06$

#### Site Visit Stream Characteristics:

Length of Segment (feet)	794
Length of Segment (mi)	0.150
Observed Width	4
Observed Depth	0.2

#### Velocity Calculations at 7Q10

Depth (ft)	Width (ft)	$R_h$ (ft)	Manning V (ft/s)	Continuity V (ft/s)	X-sec area ( $\text{ft}^2$ )	Flow (cfs)*
0.157	2.664	0.140	1.274	1.017	0.4182	0.4253
0.147	2.654	0.132	1.225	1.090	0.3901	0.4253
<b>0.137</b>	<b>2.644</b>	<b>0.124</b>	<b>1.174</b>	<b>1.174</b>	<b>0.3622</b>	<b>0.4253</b>
0.127	2.634	0.116	1.121	1.271	0.3345	0.4253
0.117	2.624	0.107	1.066	1.385	0.3070	0.4253
0.107	2.614	0.099	1.009	1.520	0.2797	0.4253
0.097	2.604	0.090	0.949	1.684	0.2526	0.4253
0.087	2.594	0.082	0.887	1.884	0.2257	0.4253
0.077	2.584	0.073	0.821	2.137	0.1990	0.4253
0.067	2.574	0.064	0.752	2.466	0.1725	0.4253
0.057	2.564	0.055	0.679	2.910	0.1461	0.4253
0.047	2.554	0.045	0.600	3.543	0.1200	0.4253
0.037	2.544	0.036	0.514	4.518	0.0941	0.4253
0.027	2.534	0.026	0.419	6.216	0.0684	0.4253
0.017	2.524	0.017	0.309	9.911	0.0429	0.4253
0.007	2.514	0.007	0.172	24.165	0.0176	0.4253
-0.003	2.504	-0.003	#NUM!	-56.610	-0.0075	0.4253
-0.013	2.494	-0.013	#NUM!	-13.116	-0.0324	0.4253
-0.023	2.484	-0.023	#NUM!	-7.443	-0.0571	0.4253
-0.033	2.474	-0.034	#NUM!	-5.209	-0.0816	0.4253

\*Includes discharge

Bold font indicates resolved velocities.

Information for Model	
Elevation Beginning (feet)	<b>1100</b>
Elevation Ending (feet)	<b>1080</b>
Drainage Area at Beginning (sq mi.)	<b>0.17</b>
Drainage Area at End (sq mi.)	<b>0.18</b>

## Regional DO Model Calculations

**South Fork Goose Creek, UT  
Segment 2**

Velocity and area calculations to use in table.

		Rectangular	
		Velocity Calculations at 7Q10	
Manning n	Slope (ft/ft)	Effluent Flow MGD	Stream Flow + trib MGD
0.05	0.018	0.0048	0.3017

Stream characteristics at 7Q10 conditions calculated in table.

Depth (ft)	Width (ft)	Velocity (ft/s)
0.165	2.678	1.095

Manning Equation                                    Rectangular  
 $V(\text{fps}) = (1.486/n) * R_h^{(2/3)} * S^{.5}$        $R_h = (d * w) / (w + 2d)$

Rectangular Surface Area =  $d * w$

Continuity Equation

$V = Q/A$

Roughness Coefficient		
Factors	n	+
sand bottom	0.05	
silt bottom	0.07	
gravel bottom	0.09	
small rock bot	0.11	
large rock bott	0.15	
boulder botton	0.18	
modest meander	n+0.02	
severe meander	n+0.04	
light plants	n+0.03	
heavy plants	n+0.06	

### Site Visit Stream Characteristics:

Length of Segment (feet)	1142
Length of Segment (mi)	0.216
Observed Width	2
Observed Depth	0.2

Depth (ft)	Width (ft)	$R_h$ (ft)	Manning V (ft/s)	Continuity V (ft/s)	X-sec area (ft <sup>2</sup> )	Flow (cfs)*
0.183	2.787	0.162	1.168	0.930	0.5100	0.4743
0.173	2.687	0.153	1.126	1.020	0.4649	0.4743
<b>0.163</b>	<b>2.677</b>	<b>0.145</b>	<b>1.087</b>	<b>1.087</b>	<b>0.4364</b>	<b>0.4743</b>
0.153	2.667	0.137	1.047	1.162	0.4081	0.4743
0.143	2.657	0.129	1.005	1.248	0.3800	0.4743
0.133	2.647	0.121	0.961	1.347	0.3521	0.4743
0.123	2.637	0.113	0.917	1.462	0.3244	0.4743
0.113	2.627	0.104	0.870	1.598	0.2969	0.4743
0.103	2.617	0.095	0.822	1.759	0.2696	0.4743
0.093	2.607	0.087	0.771	1.956	0.2425	0.4743
0.083	2.597	0.078	0.718	2.200	0.2156	0.4743
0.073	2.587	0.069	0.662	2.511	0.1889	0.4743
0.063	2.577	0.060	0.603	2.921	0.1624	0.4743
0.053	2.567	0.051	0.540	3.486	0.1361	0.4743
0.043	2.557	0.042	0.472	4.313	0.1100	0.4743
0.033	2.547	0.032	0.398	5.643	0.0841	0.4743
0.023	2.537	0.023	0.314	8.128	0.0584	0.4743
0.013	2.527	0.013	0.216	14.437	0.0329	0.4743
0.003	2.517	0.003	0.082	62.808	0.0076	0.4743
-0.007	2.507	-0.007	#NUM!	-27.025	-0.0175	0.4743

\*Includes discharge

Bold font indicates resolved velocities.

Information for Model	
Elevation Beginning (feet)	<b>1080</b>
Elevation Ending (feet)	<b>1060</b>
Drainage Area at Beginning (sq mi.)	<b>0.18</b>
Drainage Area at End (sq mi.)	<b>0.42</b>
Drainage to Flow Conversion *	<b>0.0317</b>
Drainage Area for Tributary (mi <sup>2</sup> )	<b>0.57</b>

\*conversion = (MGD/drainage area)0.65 MGD/11.7 m<sup>2</sup>  
(from flow frequency memo)

REGIONAL MODELING SYSTEM VERSION 4.0  
**Model Input File for the Discharge  
to SOUTH FORK GOOSE CREEK, UT.**

**File Information**

File Name: C:\Documents and Settings\blfrance\My Documents\Working files\BECKY\F  
Date Modified: January 28, 2008

**Water Quality Standards Information**

Stream Name: SOUTH FORK GOOSE CREEK, UT  
River Basin: Roanoke River Basin  
Section: 5a  
Class: III - Nontidal Waters (Coastal and Piedmont)  
Special Standards: PWS

**Background Flow Information**

Gauge Used: Tinker Creek near Daleville  
Gauge Drainage Area: 11.7 Sq.Mi.  
Gauge 7Q10 Flow: 0.65 MGD  
Headwater Drainage Area: 0 Sq.Mi.  
Headwater 7Q10 Flow: 0.27 MGD (Net; includes Withdrawals/Discharges)  
Withdrawal/Discharges: 0 MGD  
Incremental Flow in Segments: 5.555556E-02 MGD/Sq.Mi.

**Background Water Quality**

Background Temperature: 25 Degrees C  
Background cBOD5: 2 mg/l  
Background TKN: 0 mg/l  
Background D.O.: 7.212855 mg/l

**Model Segmentation**

Number of Segments: 2  
Model Start Elevation: 1100 ft above MSL  
Model End Elevation: 1060 ft above MSL

REGIONAL MODELING SYSTEM VERSION 4.0  
Model Input File for the Discharge  
to SOUTH FORK GOOSE CREEK, UT.

Segment Information for Segment 1

Definition Information

Segment Definition: A discharge enters.  
Discharge Name: WOODHAVEN NURSING HOME WWTP  
VPDES Permit No.:

Discharger Flow Information

Flow: 0.0048 MGD  
cBOD5: 30 mg/l  
TKN: 20 mg/l  
D.O.: 0 mg/l  
Temperature: 25 Degrees C

Geographic Information

Segment Length: 0.15 miles  
Upstream Drainage Area: 0 Sq.Mi.  
Downstream Drainage Area: 0.18 Sq.Mi.  
Upstream Elevation: 1100 Ft.  
Downstream Elevation: 1080 Ft.

Hydraulic Information

Segment Width: 2.644 Ft.  
Segment Depth: 0.137 Ft.  
Segment Velocity: 1.174 Ft./Sec.  
Segment Flow: 0.275 MGD  
Incremental Flow: 0.01 MGD (Applied at end of segment.)

Channel Information

Cross Section: Rectangular  
Character: Mostly Straight  
Pool and Riffle: No  
Bottom Type: Sand  
Sludge: None  
Plants: None  
Algae: None

REGIONAL MODELING SYSTEM VERSION 4.0  
Model Input File for the Discharge  
to SOUTH FORK GOOSE CREEK, UT.

**Segment Information for Segment 2**

**Definition Information**

Segment Definition: A tributary enters.  
Tributary Name: UNNAMED TRIBUTARY

**Tributary Flow Information**

Flow: 0.0317 MGD  
cBOD5: 2 mg/l  
TKN: 0 mg/l  
D.O.: 7.218 mg/l  
Temperature: 25 Degrees C

**Geographic Information**

Segment Length: 0.216 miles  
Upstream Drainage Area: 0.18 Sq.Mi.  
Downstream Drainage Area: 0.42 Sq.Mi.  
Upstream Elevation: 1080 Ft.  
Downstream Elevation: 1060 Ft.

**Hydraulic Information**

Segment Width: 2.676 Ft.  
Segment Depth: 0.163 Ft.  
Segment Velocity: 1.087 Ft./Sec.  
Segment Flow: 0.307 MGD  
Incremental Flow: 0.013 MGD (Applied at end of segment.)

**Channel Information**

Cross Section: Rectangular  
Character: Mostly Straight  
Pool and Riffle: No  
Bottom Type: Sand  
Sludge: None  
Plants: None  
Algae: None

modout.txt  
 "Model Run For C:\Documents and Settings\b1france\My Documents\working  
 files\BECKY\PERMITS\VPDES\Woodhaven\Reissuance 2008\Data\Woodhaven 4800 model data  
 eval 2008 3.mod On 1/28/2008 1:57:18 PM"  
 "Model is for SOUTH FORK GOOSE CREEK, UT."  
 "Model starts at the WOODHAVEN NURSING HOME WWTP discharge."  
 "Background Data"  
 "7Q10", "cBOD5", "TKN", "DO", "Temp"  
 "(mgd)", "(mg/l)", "(mg/l)", "(mg/l)", "deg C"  
 .27, 2, 0, 7.213, 25  
 "Discharge/Tributary Input Data for Segment 1"  
 "Flow", "cBOD5", "TKN", "DO", "Temp"  
 "(mgd)", "(mg/l)", "(mg/l)", "(mg/l)", "deg C"  
 .0048, 30, 20, 0, 25  
 "Hydraulic Information for Segment 1"  
 "Length", "Width", "Depth", "Velocity"  
 "(mi)", "(ft)", "(ft)", "(ft/sec)"  
 .15, 2.644, .137, 1.174  
 "Initial Mix Values for Segment 1"  
 "Flow", "DO", "cBOD", "nBOD", "DOSat", "Temp"  
 "(mgd)", "(mg/l)", "(mg/l)", "(mg/l)", "(mg/l)", "deg C"  
 .2748, 7.087, 6.223, 1.286, 8.017, 25  
 "Rate Constants for Segment 1. - (All units Per Day)"  
 "k1", "k1@T", "k2", "k2@T", "kn", "kn@T", "BD", "BD@T"  
 1.5, 1.887, 20, 22.518, .55, .808, 0, 0  
 "Output for Segment 1"  
 "Segment starts at WOODHAVEN NURSING HOME WWTP"  
 "Total", "Segm."  
 "Dist.", "Dist.", "DO", "cBOD", "nBOD"  
 "(mi)", "(mi)", "(mg/l)", "(mg/l)", "(mg/l)"  
 0, 0, 7.087, 6.223, 1.286  
 .1, .1, 7.127, 6.162, 1.281  
 .15, .15, 7.146, 6.132, 1.278  
 "Discharge/Tributary Input Data for Segment 2"  
 "Flow", "cBOD5", "TKN", "DO", "Temp"  
 "(mgd)", "(mg/l)", "(mg/l)", "(mg/l)", "deg C"  
 .0317, 2, 0, 7.218, 25  
 "Incremental Flow Input Data for Segment 2"  
 "Flow", "cBOD5", "TKN", "DO", "Temp"  
 "(mgd)", "(mg/l)", "(mg/l)", "(mg/l)", "deg C"  
 .01, 2, 0, 7.221, 25  
 "Hydraulic Information for Segment 2"  
 "Length", "Width", "Depth", "Velocity"  
 "(mi)", "(ft)", "(ft)", "(ft/sec)"  
 .216, 2.676, .163, 1.087  
 "Initial Mix Values for Segment 2"  
 "Flow", "DO", "cBOD", "nBOD", "DOSat", "Temp"  
 "(mgd)", "(mg/l)", "(mg/l)", "(mg/l)", "(mg/l)", "deg C"  
 .3165, 7.156, 5.983, 1.11, 8.023, 25

modout.txt

"Rate Constants for Segment 2. - (All units Per Day)"  
"k1", "k1@T", "k2", "k2@T", "kn", "kn@T", "BD", "BD@T"  
1.5, 1.887, 20, 22.518, .55, .808, 0, 0

"Output for Segment 2"  
"Segment starts at UNNAMED TRIBUTARY"  
"Total", "Segm."  
"Dist.", "Dist.", "DO", "cBOD", "nBOD"  
"(mi)", "(mi)", "(mg/l)", "(mg/l)", "(mg/l)"  
.15, 0, 7.156, 5.983, 1.11  
.25, .1, 7.195, 5.92, 1.105  
.35, .2, 7.221, 5.858, 1.1  
.366, .216, 7.221, 5.848, 1.099

"END OF FILE"

**0.0066 MGD Facility**

## Regional DO Model Calculations

**South Fork Goose Creek, UT  
Segment 1**

Velocity and area calculations to use in table.

7Q10			
Manning n	Slope	Effluent Flow MGD	Stream Flow MGD
0.05	0.025	0.0066	0.27

Stream characteristics at 7Q10 conditions calculated in table.

Depth (ft)	Width (ft)	Velocity (ft/s)
0.137	2.661	1.174

Manning Equation                            Rectangular  
 $V(\text{fps}) = (1.486/n) * R_h^{(2/3)} * S^{.5}$        $R_h = d * w / (2d + w)$

Rectangular Surface Area =  $d * w$

Continuity Equation  
 $V = Q/A$

Roughness Coefficient		
Factors	n	+
sand bottom	0.05	
silt bottom	0.07	
gravel bottom	0.09	
small rock	0.11	
large rock	0.15	
boulders	0.18	
modest meander		$n+0.02$
severe meander	0.00	$n+0.04$
light plants		$n+0.03$
heavy plants		$n+0.06$

### Site Visit Stream Characteristics:

Length of Segment (feet)	794
Length of Segment (mi)	0.150
Observed Width	4
Observed Depth	0.2

### Velocity Calculations at 7Q10

Depth (ft)	Width (ft)	$R_h$ (ft)	Manning V (ft/s)	Continuity V (ft/s)	X-sec area ( $\text{ft}^2$ )	Flow (cfs)*
0.157	2.681	0.141	1.275	1.017	0.4209	0.4280
0.147	2.671	0.132	1.225	1.090	0.3926	0.4280
<b>0.137</b>	<b>2.661</b>	0.124	<b>1.174</b>	<b>1.174</b>	0.3646	0.4280
0.127	2.651	0.116	1.121	1.271	0.3367	0.4280
0.117	2.641	0.107	1.066	1.385	0.3090	0.4280
0.107	2.631	0.099	1.009	1.520	0.2815	0.4280
0.097	2.621	0.090	0.949	1.684	0.2542	0.4280
0.087	2.611	0.082	0.887	1.884	0.2272	0.4280
0.077	2.601	0.073	0.822	2.137	0.2003	0.4280
0.067	2.591	0.064	0.752	2.466	0.1736	0.4280
0.057	2.581	0.055	0.679	2.910	0.1471	0.4280
0.047	2.571	0.045	0.600	3.542	0.1208	0.4280
0.037	2.561	0.036	0.514	4.517	0.0948	0.4280
0.027	2.551	0.026	0.419	6.215	0.0689	0.4280
0.017	2.541	0.017	0.309	9.909	0.0432	0.4280
0.007	2.531	0.007	0.172	24.160	0.0177	0.4280
-0.003	2.521	-0.003	#NUM!	-56.597	-0.0076	0.4280
-0.013	2.511	-0.013	#NUM!	-13.113	-0.0326	0.4280
-0.023	2.501	-0.023	#NUM!	-7.441	-0.0575	0.4280
-0.033	2.491	-0.034	#NUM!	-5.207	-0.0822	0.4280

\*Includes discharge

Bold font indicates resolved velocities.

### Information for Model

Elevation Beginning (feet)	<b>1100</b>
Elevation Ending (feet)	<b>1080</b>
Drainage Area at Beginning (sq mi.)	<b>0.17</b>
Drainage Area at End (sq mi.)	<b>0.18</b>

## Regional DO Model Calculations

**South Fork Goose Creek, UT  
Segment 2**

Velocity and area calculations to use in table.

		Rectangular	
Manning n	Slope (ft/ft)	Effluent Flow MGD	trib MGD
0.05	0.018	0.0066	0.3017

7Q10

Stream

Flow +

Effluent Flow trib

MGD MGD

Stream characteristics at 7Q10 conditions calculated in table.		
Depth (ft)	Width (ft)	Velocity (ft/s)
0.158	2.82	1.071

Manning Equation

$$V(\text{fps}) = (1.486/n) * R_h^{(2/3)} * S^{.5}$$

Rectangular

$$R_h = (d * w) / (w + 2d)$$

Rectangular Surface Area = d\*w

Continuity Equation

$$V = Q/A$$

Roughness Coefficient		
Factors	n	+
sand bottom	0.05	
silt bottom	0.07	
gravel bottom	0.09	
small rock bot	0.11	
large rock bott	0.15	
boulder botton	0.18	
modest meander	n+0.02	
severe meander	n+0.04	
light plants	n+0.03	
heavy plants	n+0.06	

### Site Visit Stream Characteristics:

Length of Segment (feet)	1142
Length of Segment (mi)	0.216
Observed Width	2
Observed Depth	0.2

### Velocity Calculations at 7Q10

Depth (ft)	Width (ft)	R <sub>h</sub> (ft)	Manning V (ft/s)	Continuity V (ft/s)	X-sec area (ft <sup>2</sup> )	Flow (cfs)*
0.188	2.94	0.167	1.191	0.863	0.5527	0.4770
0.178	2.84	0.158	1.150	0.944	0.5055	0.4770
0.168	2.83	0.150	1.111	1.003	0.4754	0.4770
<b>0.158</b>	<b>2.82</b>	<b>0.142</b>	<b>1.071</b>	<b>1.071</b>	<b>0.4456</b>	<b>0.4770</b>
0.148	2.81	0.134	1.029	1.147	0.4159	0.4770
0.138	2.8	0.126	0.987	1.235	0.3864	0.4770
0.128	2.79	0.117	0.942	1.336	0.3571	0.4770
0.118	2.78	0.109	0.896	1.454	0.3280	0.4770
0.108	2.77	0.100	0.848	1.595	0.2992	0.4770
0.098	2.76	0.092	0.799	1.764	0.2705	0.4770
0.088	2.75	0.083	0.747	1.971	0.2420	0.4770
0.078	2.74	0.074	0.692	2.232	0.2137	0.4770
0.068	2.73	0.065	0.634	2.570	0.1856	0.4770
0.058	2.72	0.056	0.573	3.024	0.1578	0.4770
0.048	2.71	0.046	0.508	3.667	0.1301	0.4770
0.038	2.7	0.037	0.436	4.650	0.1026	0.4770
0.028	2.69	0.027	0.358	6.334	0.0753	0.4770
0.018	2.68	0.018	0.268	9.889	0.0482	0.4770
0.008	2.67	0.008	0.157	22.334	0.0214	0.4770
-0.002	2.66	-0.002	#NUM!	-89.670	-0.0053	0.4770

\*Includes discharge

Bold font indicates resolved velocities.

### Information for Model

Elevation Beginning (feet)	<b>1080</b>
Elevation Ending (feet)	<b>1060</b>
Drainage Area at Beginning (sq mi.)	<b>0.18</b>
Drainage Area at End (sq mi.)	<b>0.42</b>
Drainage to Flow Conversion *	<b>0.0317</b>
Drainage Area for Tributary (mi <sup>2</sup> )	<b>0.57</b>

\*conversion = (MGD/drainage area)0.65 MGD/11.7 m<sup>2</sup>  
(from flow frequency memo)

REGIONAL MODELING SYSTEM VERSION 4.0  
**Model Input File for the Discharge  
to SOUTH FORK GOOSE CREEK, UT.**

**File Information**

File Name: C:\Documents and Settings\blfrance\My Documents\Working files\BECKY\F  
Date Modified: January 29, 2008

**Water Quality Standards Information**

Stream Name: SOUTH FORK GOOSE CREEK, UT  
River Basin: Roanoke River Basin  
Section: 5a  
Class: III - Nontidal Waters (Coastal and Piedmont)  
Special Standards: PWS

**Background Flow Information**

Gauge Used: Tinker Creek near Daleville  
Gauge Drainage Area: 11.7 Sq.Mi.  
Gauge 7Q10 Flow: 0.65 MGD  
Headwater Drainage Area: 0 Sq.Mi.  
Headwater 7Q10 Flow: 0.27 MGD (Net; includes Withdrawals/Discharges)  
Withdrawal/Discharges: 0 MGD  
Incremental Flow in Segments: 5.555556E-02 MGD/Sq.Mi.

**Background Water Quality**

Background Temperature: 25 Degrees C  
Background cBOD5: 2 mg/l  
Background TKN: 0 mg/l  
Background D.O.: 7.212855 mg/l

**Model Segmentation**

Number of Segments: 2  
Model Start Elevation: 1100 ft above MSL  
Model End Elevation: 1060 ft above MSL

REGIONAL MODELING SYSTEM VERSION 4.0  
Model Input File for the Discharge  
to SOUTH FORK GOOSE CREEK, UT.

**Segment Information for Segment 1**

**Definition Information**

Segment Definition: A discharge enters.  
Discharge Name: UNNAMED TRIBUTARY  
VPDES Permit No.:

**Discharger Flow Information**

Flow: 0.0066 MGD  
cBOD5: 30 mg/l  
TKN: 20 mg/l  
D.O.: 0 mg/l  
Temperature: 25 Degrees C

**Geographic Information**

Segment Length: 0.15 miles  
Upstream Drainage Area: 0 Sq.Mi.  
Downstream Drainage Area: 0.18 Sq.Mi.  
Upstream Elevation: 1100 Ft.  
Downstream Elevation: 1080 Ft.

**Hydraulic Information**

Segment Width: 2.661 Ft.  
Segment Depth: 0.137 Ft.  
Segment Velocity: 1.174 Ft./Sec.  
Segment Flow: 0.277 MGD  
Incremental Flow: 0.01 MGD (Applied at end of segment.)

**Channel Information**

Cross Section: Rectangular  
Character: Mostly Straight  
Pool and Ripple: No  
Bottom Type: Sand  
Sludge: None  
Plants: None  
Algae: None

REGIONAL MODELING SYSTEM VERSION 4.0  
Model Input File for the Discharge  
to SOUTH FORK GOOSE CREEK, UT.

**Segment Information for Segment 2**

**Definition Information**

Segment Definition: A tributary enters.  
Tributary Name: UNNAMED TRIBUTARY

**Tributary Flow Information**

Flow: 0.0317 MGD  
cBOD5: 2 mg/l  
TKN: 0 mg/l  
D.O.: 7.218 mg/l  
Temperature: 25 Degrees C

**Geographic Information**

Segment Length: 0.216 miles  
Upstream Drainage Area: 0.18 Sq.Mi.  
Downstream Drainage Area: 0.42 Sq.Mi.  
Upstream Elevation: 1080 Ft.  
Downstream Elevation: 1060 Ft.

**Hydraulic Information**

Segment Width: 2.82 Ft.  
Segment Depth: 0.158 Ft.  
Segment Velocity: 1.071 Ft./Sec.  
Segment Flow: 0.308 MGD  
Incremental Flow: 0.013 MGD (Applied at end of segment.)

**Channel Information**

Cross Section: Rectangular  
Character: Mostly Straight  
Pool and Riffle: No  
Bottom Type: Sand  
Sludge: None  
Plants: None  
Algae: None

modout.txt

"Model Run For C:\Documents and Settings\blfrance\My Documents\Working files\BECKY\PERMITS\VPDES\Woodhaven\Reissuance 2008\Data\Woodhaven 6600 model data eval 2008 2.mod On 1/29/2008 3:34:11 PM"

"Model is for SOUTH FORK GOOSE CREEK, UT."

"Model starts at the UNNAMED TRIBUTARY discharge."

"Background Data"

"7Q10"	"cBOD5"	"TKN"	"DO"	"Temp"
"(mgd)"	"(mg/l)"	"(mg/l)"	"(mg/l)"	"deg C"
.27,	2,	0,	7.213,	25

"Discharge/Tributary Input Data for Segment 1"

"Flow"	"cBOD5"	"TKN"	"DO"	"Temp"
"(mgd)"	"(mg/l)"	"(mg/l)"	"(mg/l)"	"deg C"
.0066,	30,	20,	,0,	25

"Hydraulic Information for Segment 1"

"Length", "width", "Depth", "Velocity"	
"(mi)", "(ft)", "(ft)", "(ft/sec)"	
.15, 2.661, .137, 1.174	

"Initial Mix Values for Segment 1"

"Flow", "DO", "cBOD", "nBOD", "DOSat", "Temp"	
"(mgd)", "(mg/l)", "(mg/l)", "(mg/l)", "(mg/l)", "deg C"	
.2766, 7.041, 6.67, 1.756, 8.017, 25	

"Rate Constants for Segment 1. - (All units Per Day)"

"k1", "k1@T", "k2", "k2@T", "kn", "kn@T", "BD", "BD@T"	
1.5, 1.887, 20, 22.518, .55, .808, 0, 0	

"Output for Segment 1"

"Segment starts at UNNAMED TRIBUTARY"

"Total", "Segm."

"Dist.", "Dist.", "DO", "cBOD", "nBOD"	
"(mi)", "(mi)", "(mg/l)", "(mg/l)", "(mg/l)"	
0, 0, 7.041, 6.67, 1.756	
.1, .1, 7.08, 6.605, 1.749	
.15, .15, 7.098, 6.573, 1.745	

"Discharge/Tributary Input Data for Segment 2"

"Flow", "cBOD5", "TKN", "DO", "Temp"	
"(mgd)", "(mg/l)", "(mg/l)", "(mg/l)", "deg C"	
.0317, 2, 0, ,7.218, 25	

"Incremental Flow Input Data for Segment 2"

"Flow", "cBOD5", "TKN", "DO", "Temp"	
"(mgd)", "(mg/l)", "(mg/l)", "(mg/l)", "deg C"	
.01, 2, 0, ,7.221, 25	

"Hydraulic Information for Segment 2"

"Length", "width", "Depth", "Velocity"	
"(mi)", "(ft)", "(ft)", "(ft/sec)"	
.216, 2.82, .158, 1.071	

"Initial Mix Values for Segment 2"

"Flow", "DO", "cBOD", "nBOD", "posat", "Temp"	
"(mgd)", "(mg/l)", "(mg/l)", "(mg/l)", "(mg/l)", "deg C"	
.3183, 7.114, 6.367, 1.516, 8.023, 25	

modout.txt

"Rate Constants for Segment 2. - (All units Per Day)"  
"k1", "k1@T", "k2", "k2@T", "kn", "kn@T", "BD", "BD@T"  
1.5, 1.887, 20, 22.518, .55, .808, 0, 0

"Output for Segment 2"  
"Segment starts at UNNAMED TRIBUTARY"

"Total", "Segm."  
"Dist.", "Dist.", "DO", "cBOD", "nBOD"  
"(mi)", "(mi)", "(mg/l)", "(mg/l)", "(mg/l)"  
.15, 0, 7.114, 6.367, 1.516  
.25, .1, 7.153, 6.299, 1.509  
.35, .2, 7.188, 6.232, 1.502  
.366, .216, 7.193, 6.221, 1.501

"END OF FILE"

**0.025 MGD Facility**

## Regional DO Model Calculations

**South Fork Goose Creek, UT  
Segment 1**

Rectangular

**Velocity Calculations at 7Q10**

Velocity and area calculations to use in table.

		7Q10	
Manning n	Slope	Effluent Flow MGD	Stream Flow MGD
<b>0.05</b>	<b>0.025</b>	<b>0.025</b>	<b>0.27</b>

Stream characteristics at 7Q10 conditions calculated in table.

Depth (ft)	Width (ft)	Velocity (ft/s)
<b>0.1400</b>	<b>2.736</b>	<b>1.192</b>

Manning Equation                            Rectangular  
 $V(\text{fps}) = (1.486/n) * R_h^{(2/3)} * S^{.5}$        $R_h = d * w / (2d + w)$

Rectangular Surface Area =  $d * w$

Continuity Equation  
 $V = Q/A$

Roughness Coefficient		
Factors	n	+
sand bottom	0.05	
silt bottom	0.07	
gravel bottom	0.09	
small rock	0.11	
large rock	0.15	
boulders	0.18	
modest meander		$n+0.02$
severe meander	0.00	$n+0.04$
light plants		$n+0.03$
heavy plants		$n+0.06$

Depth (ft)	Width (ft)	$R_h$ (ft)	Manning V (ft/s)	Continuity V (ft/s)	X-sec area (ft <sup>2</sup> )	Flow (cfs)*
0.19	<b>2.786</b>	0.167	1.432	0.862	0.5293	0.4565
0.18	<b>2.776</b>	0.159	1.386	0.914	0.4997	0.4565
0.17	<b>2.766</b>	0.151	1.340	0.971	0.4702	0.4565
0.16	<b>2.756</b>	0.143	1.292	1.035	0.4410	0.4565
0.15	<b>2.746</b>	0.135	1.243	1.108	0.4119	0.4565
<b>0.14</b>	<b>2.736</b>	0.127	<b>1.192</b>	<b>1.192</b>	0.3830	0.4565
0.13	2.726	0.119	1.139	1.288	0.3544	0.4565
0.12	2.716	0.110	1.085	1.401	0.3259	0.4565
0.11	2.706	0.102	1.028	1.534	0.2977	0.4565
0.100	2.696	0.093	0.969	1.693	0.2696	0.4565
0.09	2.686	0.084	0.907	1.888	0.2417	0.4565
0.08	2.676	0.075	0.842	2.132	0.2141	0.4565
0.07	2.666	0.067	0.774	2.446	0.1866	0.4565
0.06	2.656	0.057	0.702	2.865	0.1594	0.4565
0.05	2.646	0.048	0.625	3.451	0.1323	0.4565
0.04	2.636	0.039	0.541	4.330	0.1054	0.4565
0.03	2.626	0.029	0.449	5.795	0.0788	0.4565
0.02	2.616	0.020	0.344	8.725	0.0523	0.4565
0.01	2.606	0.010	0.218	17.518	0.0261	0.4565
-3.12E-17	2.596	0.000	#NUM!	#####	0.0000	0.4565

\*Includes discharge

Bold font indicates resolved velocities.

### Information for Model

Elevation Beginning (feet)	<b>1100</b>
Elevation Ending (feet)	<b>1080</b>
Drainage Area at Beginning (sq mi.)	<b>0.17</b>
Drainage Area at End (sq mi.)	<b>0.18</b>

### Site Visit Stream Characteristics:

Length of Segment (feet)	<b>794</b>
Length of Segment (mi)	<b>0.150</b>
Observed Width	<b>4</b>
Observed Depth	<b>0.2</b>

## Regional DO Model Calculations

**South Fork Goose Creek, UT  
Segment 2**

Velocity and area calculations to use in table.

7Q10		Stream Flow +	
Manning n	Slope (ft/ft)	Effluent Flow trib	MGD
0.05	0.018	0.025	0.3017

Stream characteristics at 7Q10 conditions calculated in table.		
Depth (ft)	Width (ft)	Velocity (ft/s)
0.160	2.92	1.082

Manning Equation                                   Rectangular  
 $V(\text{fps}) = (1.486/n) * R_h^{(2/3)} * S^{.5}$        $R_h = (d * w) / (w + 2d)$

Rectangular Surface Area =  $d * w$

Continuity Equation  
 $V = Q/A$

Roughness Coefficient		
Factors	n	+
sand bottom	0.05	
silt bottom	0.07	
gravel bottom	0.09	
small rock bot	0.11	
large rock bott	0.15	
boulder botton	0.18	
modest meander	n+0.02	
severe meander	n+0.04	
light plants	n+0.03	
heavy plants	n+0.06	

### Site Visit Stream Characteristics:

Length of Segment (feet)	1142
Length of Segment (mi)	0.216
Observed Width	.2
Observed Depth	0.2

### Velocity Calculations at 7Q10

Depth (ft)	Width (ft)	$R_h$ (ft)	Manning V (ft/s)	Continuity V (ft/s)	X-sec area (ft <sup>2</sup> )	Flow (cfs)*
0.210	3.06	0.185	1.275	0.787	0.6426	0.5055
0.200	2.96	0.176	1.236	0.854	0.5920	0.5055
0.190	2.95	0.168	1.199	0.902	0.5605	0.5055
0.180	2.94	0.160	1.161	0.955	0.5292	0.5055
0.170	2.93	0.152	1.122	1.015	0.4981	0.5055
<b>0.160</b>	<b>2.92</b>	<b>0.144</b>	<b>1.082</b>	<b>1.082</b>	0.4672	0.5055
0.150	2.91	0.136	1.040	1.158	0.4365	0.5055
0.140	2.9	0.128	0.997	1.245	0.4060	0.5055
0.130	2.89	0.119	0.953	1.346	0.3757	0.5055
0.120	2.88	0.111	0.907	1.463	0.3456	0.5055
0.110	2.87	0.102	0.860	1.601	0.3157	0.5055
0.100	2.86	0.093	0.810	1.768	0.2860	0.5055
0.090	2.85	0.085	0.758	1.971	0.2565	0.5055
0.080	2.84	0.076	0.704	2.225	0.2272	0.5055
0.070	2.83	0.067	0.647	2.552	0.1981	0.5055
0.060	2.82	0.058	0.586	2.988	0.1692	0.5055
0.050	2.81	0.048	0.521	3.598	0.1405	0.5055
0.040	2.8	0.039	0.451	4.514	0.1120	0.5055
0.030	2.79	0.029	0.374	6.040	0.0837	0.5055
0.020	2.78	0.020	0.287	9.092	0.0556	0.5055

\*Includes discharge

Bold font indicates resolved velocities.

### Information for Model

Elevation Beginning (feet)	<b>1080</b>
Elevation Ending (feet)	<b>1060</b>
Drainage Area at Beginning (sq mi.)	<b>0.18</b>
Drainage Area at End (sq mi.)	<b>0.42</b>
Drainage to Flow Conversion *	<b>0.0317</b>
Drainage Area for Tributary (mi <sup>2</sup> )	<b>0.57</b>

\*conversion = (MGD/drainage area)0.65 MGD/11.7 m<sup>2</sup>  
 (from flow frequency memo)

modout.txt  
"Model Run For C:\Documents and Settings\blfrance\My Documents\Working  
files\BECKY\PERMITS\VPDES\Woodhaven\Reissuance 2008\Data\Woodhaven 25000 model data  
eval 2008 violation.mod On 3/11/2008 9:10:01 AM"

"Model is for SOUTH FORK GOOSE CREEK, UT."

"Model starts at the WOODHAVEN NURSING HOME WWTP discharge."

"Background Data"

"7Q10", "CBOD5", "TKN", "DO", "Temp"  
"(mgd)", "(mg/l)", "(mg/l)", "(mg/l)", "deg C"  
.27, 2, 0, 7.213, 25

"Discharge/Tributary Input Data for Segment 1"

"Flow", "CBOD5", "TKN", "DO", "Temp"  
"(mgd)", "(mg/l)", "(mg/l)", "(mg/l)", "deg C"  
.025, 30, 9.9, 0, 25

"Hydraulic Information for Segment 1"

"Length", "Width", "Depth", "Velocity"  
"(mi)", "(ft)", "(ft)", "(ft/sec)"  
.15, 2.736, .14, 1.192

"Initial Mix Values for Segment 1"

"Flow", "DO", "CBOD", "nBOD", "DOSat", "Temp"  
"(mgd)", "(mg/l)", "(mg/l)", "(mg/l)", "(mg/l)", "deg C"  
.295, 6.602, 10.932, 2.532, 8.017, 25

"Rate Constants for Segment 1. - (All units Per Day)"

"k1", "k1@T", "k2", "k2@T", "kn", "kn@T", "BD", "BD@T"  
1.7, 2.139, 20, 22.518, .55, .808, 0, 0

"Output for Segment 1"

"Segment starts at WOODHAVEN NURSING HOME WWTP"

"Total", "Segm."

"Dist.", "Dist.", "DO", "CBOD", "nBOD"  
"(mi)", "(mi)", "(mg/l)", "(mg/l)", "(mg/l)"  
0, 0, 6.602, 10.932, 2.532  
.1, .1, 6.634, 10.813, 2.522  
.15, .15, 6.649, 10.754, 2.517

Variation in discharge

"Discharge/Tributary Input Data for Segment 2"

"Flow", "CBOD5", "TKN", "DO", "Temp"  
"(mgd)", "(mg/l)", "(mg/l)", "(mg/l)", "deg C"  
.0317, 2, 0, 7.937, 19.6

"Incremental Flow Input Data for Segment 2"

"Flow", "CBOD5", "TKN", "DO", "Temp"  
"(mgd)", "(mg/l)", "(mg/l)", "(mg/l)", "deg C"  
.01, 2, 0, 7.281, 25

"Hydraulic Information for Segment 2"

"Length", "Width", "Depth", "Velocity"  
"(mi)", "(ft)", "(ft)", "(ft/sec)"  
.216, 2.92, .16, 1.082

"Initial Mix Values for Segment 2"

"Flow", "DO", "CBOD", "nBOD", "DOSat", "Temp"  
"(mgd)", "(mg/l)", "(mg/l)", "(mg/l)", "(mg/l)", "deg C"  
.3367, 6.789, 10.041, 2.205, 8.09, 24.49159

modout.txt

"Rate Constants for Segment 2. - (All units Per Day)"  
"k1", "k1@T", "k2", "k2@T", "kn", "kn@T", "BD", "BD@T"  
1.7, 2.089, 20, 22.248, .55, .777, 0, 0

"Output for Segment 2"  
"Segment starts at UNNAMED TRIBUTARY"  
"Total", "Segm."  
"Dist.", "Dist.", "DO", "cBOD", "nBOD"  
"(mi)", "(mi)", "(mg/l)", "(mg/l)", "(mg/l)"  
.15, 0, 6.789, 10.041, 2.205  
.25, .1, 6.823, 9.923, 2.195  
.35, .2, 6.854, 9.807, 2.185  
.366, .216, 6.859, 9.788, 2.183

"END OF FILE"

modout.txt

"Model Run For C:\Documents and Settings\blfrance\My Documents\Working files\BECKY\PERMITS\VPDES\woodhaven\Reissuance 2008\data\Woodhaven 25000 model data eval 2008 new mod final.mod On 3/11/2008 9:34:11 AM"

"Model is for SOUTH FORK GOOSE CREEK, UT."

"Model starts at the WOODHAVEN NURSING HOME WWTP discharge."

"Background Data"

"7Q10"	"cBOD5"	"TKN"	"DO"	"Temp"
"(mgd)"	"(mg/l)"	"(mg/l)"	"(mg/l)"	"deg C"
.27,	2,	0,	7.213,	25

"Discharge/Tributary Input Data for Segment 1"

"Flow"	"cBOD5"	"TKN"	"DO"	"Temp"
"(mgd)"	"(mg/l)"	"(mg/l)"	"(mg/l)"	"deg C"
.025,	30,	9.9,	,5.2,	25

"Hydraulic Information for Segment 1"

"Length", "Width", "Depth", "Velocity"	
"(mi)", "(ft)", "(ft)", "(ft/sec)"	
.15, 2.736, .14, 1.192	

"Initial Mix Values for Segment 1"

"Flow", "DO", "cBOD", "nBOD", "DOSat", "Temp"	
"(mgd)", "(mg/l)", "(mg/l)", "(mg/l)", "(mg/l)", "deg C"	
.295, 7.042, 10.932, 2.532, 8.017, 25	

"Rate Constants for Segment 1. - (All units Per Day)"

"k1", "k1@T", "k2", "k2@T", "kn", "kn@T", "BD", "BD@T"	
1.7, 2.139, 20, 22.518, .55, .808, 0, 0	

"Output for Segment 1"

"Segment starts at WOODHAVEN NURSING HOME WWTP"

"Total", "Segm."	
"Dist.", "Dist.", "DO", "cBOD", "nBOD"	
"(mi)", "(mi)", "(mg/l)", "(mg/l)", "(mg/l)"	
0, 0, 7.042, 10.932, 2.532	
.1, .1, 7.026, 10.813, 2.522	
.15, .15, 7.019, 10.754, 2.517	

"Discharge/Tributary Input Data for Segment 2"

"Flow", "cBOD5", "TKN", "DO", "Temp"	
"(mgd)", "(mg/l)", "(mg/l)", "(mg/l)", "deg C"	
.0317, 2, 0, ,7.937, 19.6	

"Incremental Flow Input Data for Segment 2"

"Flow", "cBOD5", "TKN", "DO", "Temp"	
"(mgd)", "(mg/l)", "(mg/l)", "(mg/l)", "deg C"	
.01, 2, 0, ,7.281, 25	

"Hydraulic Information for Segment 2"

"Length", "Width", "Depth", "Velocity"	
"(mi)", "(ft)", "(ft)", "(ft/sec)"	
.216, 2.92, .16, 1.082	

"Initial Mix Values for Segment 2"

"Flow", "DO", "cBOD", "nBOD", "DOSat", "Temp"	
"(mgd)", "(mg/l)", "(mg/l)", "(mg/l)", "(mg/l)", "deg C"	
.3367, 7.113, 10.041, 2.205, 8.09, 24.49159	

modout.txt

"Rate Constants for Segment 2. - (All units Per Day)"  
"k1", "k1@T", "k2", "k2@T", "kn", "kn@T", "BD", "BD@T"  
1.7, 2.089, 20, 22.248, .55, .777, 0, 0

"Output for Segment 2"  
"Segment starts at UNNAMED TRIBUTARY"  
"Total", "Segm."  
"Dist.", "Dist.", "DO", "cBOD", "nBOD"  
"(mi)", "(mi)", "(mg/l)", "(mg/l)", "(mg/l)"  
.15, 0, 7.113, 10.041, 2.205  
.25, .1, 7.109, 9.923, 2.195  
.35, .2, 7.106, 9.807, 2.185  
.366, .216, 7.106, 9.788, 2.183

"END OF FILE"

REGIONAL MODELING SYSTEM VERSION 4.0  
**Model Input File for the Discharge  
to SOUTH FORK GOOSE CREEK, UT.**

**File Information**

File Name: C:\Documents and Settings\blfrance\My Documents\Working files\BECKY\F  
Date Modified: March 11, 2008

**Water Quality Standards Information**

Stream Name: SOUTH FORK GOOSE CREEK, UT  
River Basin: Roanoke River Basin  
Section: 5a  
Class: III - Nontidal Waters (Coastal and Piedmont)  
Special Standards: PWS

**Background Flow Information**

Gauge Used: Tinker Creek near Daleville  
Gauge Drainage Area: 11.7 Sq.Mi.  
Gauge 7Q10 Flow: 0.65 MGD  
Headwater Drainage Area: 0 Sq.Mi.  
Headwater 7Q10 Flow: 0.27 MGD (Net; includes Withdrawals/Discharges)  
Withdrawal/Discharges: 0 MGD  
Incremental Flow in Segments: 5.555556E-02 MGD/Sq.Mi.

**Background Water Quality**

Background Temperature: 25 Degrees C  
Background cBOD5: 2 mg/l  
Background TKN: 0 mg/l  
Background D.O.: 7.212855 mg/l

**Model Segmentation**

Number of Segments: 2  
Model Start Elevation: 1100 ft above MSL  
Model End Elevation: 1060 ft above MSL

REGIONAL MODELING SYSTEM VERSION 4.0  
**Model Input File for the Discharge**  
**to SOUTH FORK GOOSE CREEK, UT.**

**Segment Information for Segment 1**

**Definition Information**

Segment Definition: A discharge enters.  
Discharge Name: WOODHAVEN NURSING HOME WWTP  
VPDES Permit No.: VA0074870

**Discharger Flow Information**

Flow: 0.025 MGD  
cBOD5: 30 mg/l  
TKN: 9.9 mg/l  
D.O.: 5.2 mg/l  
Temperature: 25 Degrees C

**Geographic Information**

Segment Length: 0.15 miles  
Upstream Drainage Area: 0 Sq.Mi.  
Downstream Drainage Area: 0.18 Sq.Mi.  
Upstream Elevation: 1100 Ft.  
Downstream Elevation: 1080 Ft.

**Hydraulic Information**

Segment Width: 2.736 Ft.  
Segment Depth: 0.14 Ft.  
Segment Velocity: 1.192 Ft./Sec.  
Segment Flow: 0.295 MGD  
Incremental Flow: 0.01 MGD (Applied at end of segment.)

**Channel Information**

Cross Section: Rectangular  
Character: Mostly Straight  
Pool and Riffle: No  
Bottom Type: Sand  
Sludge: None  
Plants: None  
Algae: None

REGIONAL MODELING SYSTEM VERSION 4.0  
Model Input File for the Discharge  
to SOUTH FORK GOOSE CREEK, UT.

**Segment Information for Segment 2**

**Definition Information**

Segment Definition: A tributary enters.  
Tributary Name: UNNAMED TRIBUTARY

**Tributary Flow Information**

Flow: 0.0317 MGD  
cBOD5: 2 mg/l  
TKN: 0 mg/l  
D.O.: 7.937 mg/l  
Temperature: 19.6 Degrees C

**Geographic Information**

Segment Length: 0.216 miles  
Upstream Drainage Area: 0.18 Sq.Mi.  
Downstream Drainage Area: 0.42 Sq.Mi.  
Upstream Elevation: 1080 Ft.  
Downstream Elevation: 1060 Ft.

**Hydraulic Information**

Segment Width: 2.92 Ft.  
Segment Depth: 0.16 Ft.  
Segment Velocity: 1.082 Ft./Sec.  
Segment Flow: 0.327 MGD  
Incremental Flow: 0.013 MGD (Applied at end of segment.)

**Channel Information**

Cross Section: Rectangular  
Character: Mostly Straight  
Pool and Riffle: No  
Bottom Type: Sand  
Sludge: None  
Plants: None  
Algae: None

## **Attachment G**

### **Effluent Data**

Woodhaven Nursing Home WWTP  
VA0074870

**Ammonia as N and TKN Data for Demonstration Project**

Date	Ammonia as N (mg/l)	TKN (mg/l)	TKN - Ammonia
3/19/03	5.400		
3/18/03		9.840	
3/12/03	11.700	13.200	1.500
3/6/03	6.140	10.200	4.060
2/19/03	0.380	0.860	0.480
2/25/03	1.920	2.590	0.670
2/12/03	<0.200	0.790	
2/5/03	11.000	13.000	2.000
1/29/03	4.580	5.430	0.850
1/22/03	7.930	9.950	2.020
1/15/03	<0.200	0.520	
1/7/03	<0.200	<0.500	
12/29/02	1.700	2.180	0.480
12/22/02	0.860	2.090	1.230
12/17/02	0.220	0.870	0.650
12/9/02	1.300	3.860	2.560
12/3/02	<0.200	<0.500	
11/26/02	<0.200	0.660	
11/19/02	<0.200	0.800	
11/12/02	<0.200	0.840	
11/5/02	9.770	11.100	1.330
10/26/02	<0.200	0.650	
10/22/02	4.970	5.470	0.500

Mean Difference                  1.410

Woodhaven Nursing Home WWTP  
 VPDES Permit No. VA0074870

**Effluent pH Data for 90th Percentile Calculation**

Days	Jul-06	Aug-06	Sep-06	Oct-06	Nov-06	Dec-06	Jan-07	Feb-07	Mar-07	Apr-07	May-07	Jun-07
1	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.0	7.0	7.0	7.0	7.0
2	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.0	7.0	7.0	7.5	7.0
3	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.0	7.0	7.0	7.0
4	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.0	7.0	7.5	7.0
5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.0	7.0	7.5	7.0
6	7.5	7.5	7.5	7.5	7.5	7.5	7.0	7.5	7.5	7.5	7.5	7.5
7	7.5	7.5	7.5	7.5	7.5	7.5	7.0	7.0	7.0	7.0	7.5	7.5
8	7.5	7.5	7.5	7.5	7.5	7.5	7.0	7.0	7.0	7.0	7.0	7.0
9	7.5	7.5	7.5	7.5	7.5	7.5	7.0	7.5	7.0	7.0	7.5	7.0
10	7.5	7.5	7.5	7.5	7.5	7.5	7.0	7.5	7.0	7.0	7.5	7.0
11	7.5	7.5	7.5	7.5	7.5	7.5	7.0	7.0	7.0	7.5	7.0	7.0
12	7.5	7.5	7.5	7.5	7.5	7.5	7.0	7.0	7.0	7.5	7.0	7.5
13	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.0	7.0	7.5	7.5	7.5
14	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.0	7.5	7.0	7.0	7.5
15	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.0	7.5	7.0
16	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.0	7.0	7.0
17	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.0	7.0	7.0
18	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.0
19	7.5	7.5	7.5	7.5	7.5	7.5	7.0	7.5	7.5	7.0	7.5	7.0
20	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.0	7.5	7.5	7.0	7.0
21	7.5	7.5	7.5	7.5	7.5	7.5	7.0	7.5	7.5	7.5	7.0	7.5
22	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.0	7.5	7.5	7.0	7.5
23	7.5	7.5	7.5	7.5	7.5	7.5	7.0	7.0	7.5	7.0	7.5	7.0
24	7.5	7.5	7.5	7.5	7.5	7.5	7.0	7.5	7.0	7.0	7.5	7.5
25	7.5	7.5	7.5	7.5	7.5	7.5	7.0	7.5	7.0	7.0	7.0	7.5
26	7.5	7.5	7.5	7.5	7.5	7.5	7.0	7.0	6.5	7.0	7.0	7.0
27	7.5	7.5	7.5	7.5	7.5	7.5	7.0	7.5	6.5	7.5	7.5	7.5
28	7.5	7.5	7.5	7.5	7.5	7.5	7.0	7.5	7.0	7.0	7.5	7.5
29	7.5	7.5	7.5	7.5	7.5	7.5	7.0	7.0	7.0	7.5	7.5	7.0
30	7.5	7.5	7.5	7.5	7.5	7.5	7.0	7.0	7.0	7.5	7.0	7.0
31	7.5	7.5		7.5		7.5	7.0	7.0	7.0	7.0	7.0	7.5

Data are given in Standard Units.

90th percentile pH      7.5    S.U.  
 10th percentile pH      7.0    S.U.

Woodhaven Nursing Home WWTP  
VPDES Permit No. VA0074870

**Effluent Temperature Data for 90th Percentile Calculation**

Days	Jul-08	Aug-08
1		74
2		72
3		76
4		75
5		76
6		72
7		77
8		76
9		77
10		74
11		75
12		76
13		75
14		74
15		77
16		76
17		76
18		77
19		76
20		75
21		76
22		76
23		76
24		77
25		76
26	70	75
27	75	75
28	73	76
29	71	76
30	69	75
31	71	74

90th Percentile Temperature      77 °F=      25 °C

## **Attachment H**

### **Wasteload and Limit Calculations**

- **0.0048 MGD Facility**
  - Wasteload Allocation Spreadsheet
  - STATS Program Results (TRC, Ammonia)
- **0.0066 MGD Facility**
  - Wasteload Allocation Spreadsheet
  - STATS Program Results (TRC, Ammonia)
- **0.025 MGD Facility**
  - Wasteload Allocation Spreadsheet
  - STATS Program Results (TRC, Ammonia)

**0.0048 MGD Facility**

# FRESHWATER WATER QUALITY CRITERIA / WASTELOAD ALLOCATION ANALYSIS

Facility Name: Woodhaven Nursing Home WWTP  
 Receiving Stream: South Fork Goose Creek, UT

Permit No.: VA0074840

Version: OWP Guidance Memo 00-2011 (8/24/00)

Stream Information		Stream Flows		Mixing Information				Effluent Information			
		1Q10 (Annual) =	0.27 MGD	Annual - 1Q10 Mix =	100 %	Mean Hardness (as CaCO <sub>3</sub> ) =	144 mg/L	90% Temp (Annual) =	25 deg C	90% Temp (Wet season) =	25 deg C
Mean Hardness (as CaCO <sub>3</sub> ) =	144 mg/L	7Q10 (Annual) =	0.27 MGD	- 7Q10 Mix =	100 %	90% Temp (Annual) =	25 deg C	90% Temp (Wet season) =	25 deg C	90% Maximum pH =	7.5 SU
90% Temperature (Annual) =	25 deg C	3Q10 (Annual) =	0.28 MGD	- 3Q10 Mix =	100 %	90% Maximum pH =	7.5 SU	90% Maximum pH =	7 SU	10% Maximum pH =	7 SU
90% Temperature (Wet season) =	11.9 deg C	1Q10 (Wet season) =	0.32 MGD	Wet Season - 1Q10 Mix =	100 %	10% Maximum pH =	7 SU	10% Maximum pH =	7 SU	Discharge Flow =	0.0048 MGD
90% Maximum pH =	8.2 SU	3Q10 (Wet season)	0.34 MGD	- 3Q10 Mix =	100 %						
10% Maximum pH =	7 SU	3Q05 =	0.3 MGD								
Tier Designation (1 or 2) =	2	Harmonic Mean =	0.37 MGD								
Public Water Supply (PWS) Y/N? =	y	Annual Average =	MGD								
Trout Present Y/N? =	n										
Early Life Stages Present Y/N? =	y										

Parameter (high unless noted)	Background Conc.	Water Quality Criteria Acute	Water Quality Criteria Chronic	Wasteload Allocations		Antidegradation Baseline		Antidegradation Allocations		Most Limiting Allocations					
				HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH			
Acenaphthene	0	-	-	1.2E+03	2.7E+03	-	7.6E+04	1.7E+05	-	-	7.6E+03	1.7E+04			
Acrolein	0	-	-	3.2E+02	7.8E+02	-	2.0E+04	5.0E+04	-	-	2.0E+03	5.0E+03			
Acrylonitrile <sup>c</sup>	0	-	-	5.9E-01	6.6E-00	-	4.6E+01	5.2E+02	-	-	4.6E+00	5.2E+01			
Aldrin <sup>c</sup>	0	3.0E+00	-	1.3E-03	1.4E+03	1.7E+02	-	1.0E-01	7.5E-01	4.3E+01	-	4.3E+01	-		
Ammonia-N (mg/l) (Yearly)	0	6.0E+00	9.54E-01	-	-	3.5E+02	5.7E+01	-	-	1.52E+00	2.39E-01	8.7E+01	1.4E+01		
Ammonia-N (mg/l) (High Flow)	0	6.01E+00	1.86E+00	-	-	4.1E-02	1.3E+02	-	-	1.50E+00	4.65E-01	-	-		
Anthracene	0	-	-	9.6E+03	1.1E+05	-	6.1E+05	7.0E+05	-	-	6.1E+04	7.0E+05			
Antimony	0	-	-	1.4E+01	4.3E+03	-	8.9E+02	2.7E+05	-	-	8.9E+01	2.7E+04			
Arsenic	0	3.4E+02	1.5E+02	1.0E-01	-	1.9E+04	8.6E+03	6.4E+02	-	4.9E+03	2.1E+03	6.4E+01	-		
Barium	0	-	-	2.0E+03	-	-	1.3E+05	-	-	-	1.3E+04	-	1.3E+04		
Benzene <sup>c</sup>	0	-	-	1.2E+01	7.1E+02	-	9.4E+02	5.5E+04	-	-	9.4E+01	5.5E+03	-	9.4E+01	
Benzidine <sup>c</sup>	0	-	-	1.2E-03	5.4E-03	-	9.4E-02	4.2E-01	-	-	9.4E-03	4.2E-02	-	9.4E-03	
Benzo (a) anthracene <sup>c</sup>	0	-	-	4.4E-02	4.9E-01	-	3.4E+00	3.8E+01	-	-	3.4E+01	3.8E+00	-	3.4E+01	
Benzo (b) fluoranthene <sup>c</sup>	0	-	-	4.4E-02	4.9E-01	-	3.4E+00	3.8E+01	-	-	3.4E+01	3.8E+00	-	3.4E+01	
Benzo (K) fluoranthene <sup>c</sup>	0	-	-	4.4E-02	4.9E-01	-	3.4E+00	3.8E+01	-	-	3.4E+01	3.8E+00	-	3.4E+01	
Benzo (a) pyrene <sup>c</sup>	0	-	-	4.4E-02	4.9E-01	-	3.4E+00	3.8E+01	-	-	3.4E+01	3.8E+00	-	3.4E+01	
Ethylbenzene	0	-	-	3.1E-01	1.4E+01	-	2.0E+01	8.9E+02	-	-	2.0E+00	8.9E+01	-	2.0E+00	
Ethyl-2-Chlorobutyl Ether	0	-	-	1.4E+03	1.7E+05	-	8.9E+04	1.1E+07	-	-	8.9E+03	1.1E+06	-	8.9E+03	
Ethylchloropropyl Ether	0	-	-	4.4E+01	4.4E+01	-	2.0E+02	3.4E+03	-	-	2.0E+01	3.4E+02	-	2.0E+01	
Ergosterol <sup>c</sup>	0	-	-	4.4E+01	3.6E+03	-	3.4E+03	2.8E+05	-	-	3.4E+02	2.8E+04	-	3.4E+02	
Butylbenzylphthalate	0	-	-	3.0E+03	5.2E+03	-	1.9E+05	3.3E+05	-	-	1.9E+04	3.3E+04	-	1.9E+04	
Cadmium	0	5.9E+00	1.5E+00	5.0E+00	-	3.4E+02	8.6E+01	3.2E+02	-	8.5E+01	2.2E+01	-	8.5E+01		
Carbon Tetrachloride <sup>c</sup>	0	-	-	2.5E+00	4.4E+01	-	2.0E+02	3.4E+03	-	-	2.0E+01	3.4E+02	-	2.0E+01	
Chlordane <sup>c</sup>	0	2.4E+00	4.3E+03	2.1E+02	1.4E+02	-	2.2E+02	2.5E+01	6.0E+01	1.1E-03	3.4E+01	6.2E+02	-	3.4E+01	
Chloride	0	8.6E+05	2.3E+05	2.5E+05	-	4.9E+07	1.3E+07	1.6E+07	-	2.2E+05	5.8E+04	-	1.2E+07	3.3E+06	
TRC	0	1.9E+01	1.1E+01	-	-	1.1E+03	6.3E+02	-	-	2.7E+02	2.8E+00	-	2.7E+02	1.6E+02	
Chlorobenzene	0	-	-	6.8E+02	2.1E+04	-	4.3E+04	1.3E+06	-	-	4.3E+03	1.3E+05	-	4.3E+03	1.3E+05

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations				
		Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH				
(ug/l unless noted)																						
Chlorobromomethane <sup>c</sup>	0	-	-	-	4.1E+00	3.4E+02	-	-	3.2E+02	2.7E+04	-	-	4.1E+01	3.4E+01	-	-	3.2E+01	2.7E+03	-	3.2E+01	2.7E+03	
Chloroform <sup>c</sup>	0	-	-	-	3.5E+02	2.9E+04	-	-	2.7E+04	2.3E+06	-	-	3.5E+01	2.9E+03	-	-	2.7E+05	2.3E+03	-	2.7E+03	2.3E+03	
2-Chloronaphthalene	0	-	-	-	1.7E+03	4.3E+03	-	-	1.1E+05	2.7E+05	-	-	1.7E+02	4.3E+02	-	-	1.1E+04	2.7E+04	-	1.1E+04	2.7E+04	
2-Chlorophenol	0	-	-	-	1.2E+02	4.0E+02	-	-	4.8E+00	2.3E+00	-	-	2.1E+02	1.0E+02	-	-	1.2E+00	5.9E+01	-	-	1.2E+00	5.9E+01
Chlorpyrifos	0	8.3E-02	4.1E-02	-	-	-	-	-	-	-	-	-	1.9E+02	2.5E+01	-	-	1.1E+04	1.4E+03	-	-	1.1E+04	1.4E+03
Chromium III	0	7.7E+02	1.0E+02	-	-	-	-	-	-	-	-	-	4.0E+00	2.8E+00	-	-	2.3E+02	1.6E+02	-	-	2.3E+02	1.6E+02
Chromium VI	0	1.6E+01	1.1E+01	-	-	-	-	-	-	-	-	-	1.0E+01	-	-	-	6.4E+02	-	-	-	6.4E+02	-
Chrysene <sup>c</sup>	0	-	-	-	4.4E-02	4.9E-01	-	-	6.4E+03	-	-	-	4.4E+03	4.9E+02	-	-	3.4E+01	3.8E+00	-	-	3.4E+01	3.8E+00
Copper	0	1.9E+01	1.2E+01	-	-	-	-	-	1.1E+03	7.0E+02	-	-	4.7E+00	3.1E+00	1.3E+02	-	2.7E+02	1.8E+02	8.3E+03	-	8.3E+03	-
Cyanide	0	2.2E+01	5.2E+00	7.0E+02	2.2E+05	1.3E+03	3.0E+02	4.4E+04	1.4E+07	5.5E+00	1.3E+00	7.0E+01	2.2E+04	3.1E+02	7.4E+01	4.4E+06	4.4E+03	4.4E+03	4.4E+03	4.4E+03	1.4E+06	
DDD <sup>c</sup>	0	-	-	-	8.3E-03	8.4E-03	-	-	6.5E-01	6.6E-01	-	-	8.3E-04	8.4E-04	-	-	6.5E-02	6.6E-02	-	-	6.5E-02	6.6E-02
DDE <sup>c</sup>	0	-	-	-	5.9E-03	5.9E-03	-	-	4.6E-01	4.6E-01	-	-	5.9E-04	5.9E-04	-	-	4.6E-02	4.6E-02	-	-	4.6E-02	4.6E-02
DDT <sup>c</sup>	0	1.1E+00	1.0E+03	5.9E-03	6.3E+01	5.7E+02	4.6E-01	2.8E-01	2.5E-04	5.9E-04	1.6E+01	1.4E-02	4.6E-02	1.6E+01	1.4E-00	-	-	1.4E+00	-	-	1.4E+00	1.4E+00
Demeton	0	-	-	-	4.4E-02	4.9E-01	-	-	5.7E+00	-	-	-	4.4E-03	4.9E-02	-	-	3.4E-01	3.8E+00	-	-	3.4E-01	3.8E+00
Dibenz(a)anthracene <sup>c</sup>	0	-	-	-	2.7E+03	1.2E+04	-	-	1.7E+05	7.6E+05	-	-	2.7E+02	1.2E+03	-	-	1.7E+04	7.6E+04	-	-	1.7E+04	7.6E+04
Diethyl phthalate	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Chloromethane (Methylene Chloride) <sup>c</sup>	0	-	-	-	4.7E+01	1.6E+04	-	-	3.7E+03	1.2E+06	-	-	4.7E+00	1.6E+03	-	-	3.7E+02	1.2E+05	-	-	3.7E+02	1.2E+05
1,2-Dichlorobenzene	0	-	-	-	2.7E+03	1.7E+04	-	-	1.7E+05	1.1E+06	-	-	2.7E+02	1.7E+03	-	-	1.7E+04	1.1E+05	-	-	1.7E+04	1.1E+05
1,3-Dichlorobenzene	0	-	-	-	4.0E+02	2.6E+03	-	-	2.5E+04	1.7E+05	-	-	4.0E+01	2.6E+02	-	-	2.5E+03	1.7E+04	-	-	2.5E+03	1.7E+04
1,4-Dichlorobenzene	0	-	-	-	4.0E+02	2.6E+03	-	-	2.5E+04	1.7E+05	-	-	4.0E+01	2.6E+02	-	-	2.5E+03	1.7E+04	-	-	2.5E+03	1.7E+04
3,3-Dichlorobenzidine <sup>c</sup>	0	-	-	-	4.0E-01	7.7E-01	-	-	3.1E+01	6.0E-01	-	-	4.0E-02	7.7E-02	-	-	3.1E+00	6.0E+00	-	-	3.1E+00	6.0E+00
Dichlorobromomethane <sup>c</sup>	0	-	-	-	5.6E+00	4.6E+02	-	-	4.4E+02	3.6E+04	-	-	5.6E-01	4.6E+01	-	-	4.4E+01	3.6E+03	-	-	4.4E+01	3.6E+03
1,2-Dichloroethane <sup>c</sup>	0	-	-	-	3.8E+00	9.9E+02	-	-	3.0E+02	7.7E+04	-	-	3.8E-01	9.9E+01	-	-	3.0E+01	7.7E+03	-	-	3.0E+01	7.7E+03
1,1-Dichloroethylene	0	-	-	-	3.1E+02	1.7E+04	-	-	2.0E+04	1.1E+06	-	-	3.1E+01	1.7E+03	-	-	2.0E+03	1.1E+05	-	-	2.0E+03	1.1E+05
1,2-trans-dichloroethylene	0	-	-	-	7.0E+02	1.4E+05	-	-	4.4E+04	8.9E+06	-	-	7.0E+01	1.4E+04	-	-	4.4E+03	8.9E+05	-	-	4.4E+03	8.9E+05
2,4-Dichlorophenol	0	-	-	-	9.3E+01	7.9E+02	-	-	5.9E+03	5.0E+04	-	-	9.3E+00	7.9E+01	-	-	5.9E+02	5.0E+03	-	-	5.9E+02	5.0E+03
2,4-Dichlorophenoxycetic acid (2,4-D)	0	-	-	-	1.0E+02	-	-	-	6.4E+03	-	-	-	1.0E+01	-	-	-	6.4E+02	-	-	-	6.4E+02	-
1,2-Dichloropropane <sup>c</sup>	0	-	-	-	5.2E+00	3.9E+02	-	-	4.1E+02	3.0E+04	-	-	5.2E+01	3.9E+01	-	-	4.1E+01	3.0E+03	-	-	4.1E+01	3.0E+03
1,3-Dichloropropane	0	-	-	-	1.0E+01	1.7E+03	-	-	6.4E+02	1.1E+05	-	-	1.0E+00	1.7E+02	-	-	6.4E+01	1.1E+04	-	-	6.4E+01	1.1E+04
Dieldrin <sup>c</sup>	0	2.4E-01	5.6E-02	1.4E-03	1.4E+01	3.2E+00	1.1E+01	6.0E+02	1.4E-02	1.4E-04	1.4E-04	3.4E+00	8.0E-01	1.1E+02	1.1E+02	3.4E+00	8.0E-01	1.1E+02	1.1E+02	3.4E+00	8.0E-01	
Diethyl Phthalate	0	-	-	-	2.3E+04	1.2E+05	-	-	1.5E+06	7.6E+06	-	-	2.3E+03	1.2E+04	-	-	1.5E+05	7.6E+05	-	-	1.5E+05	7.6E+05
Di-2-Ethylhexyl Phthalate <sup>c</sup>	0	-	-	-	1.8E+01	5.9E+01	-	-	1.4E+03	4.6E+03	-	-	1.8E+00	5.9E+00	-	-	1.4E+02	4.6E+02	-	-	1.4E+02	4.6E+02
2,4-Dimethylphenol	0	-	-	-	5.4E+02	2.3E+03	-	-	3.4E+04	1.5E+05	-	-	5.4E+01	2.3E+02	-	-	3.4E+03	1.5E+04	-	-	3.4E+03	1.5E+04
Beta-Endosulfan	0	-	-	-	3.1E+05	2.9E+06	-	-	2.0E+07	1.8E+08	-	-	3.1E+04	2.9E+05	-	-	2.0E+06	1.8E+07	-	-	2.0E+06	1.8E+07
Endosulfan Sulfate	0	-	-	-	2.7E+03	1.2E+04	-	-	1.7E+05	7.6E+05	-	-	2.7E+02	1.2E+03	-	-	1.7E+04	7.6E+04	-	-	1.7E+04	7.6E+04
Endrin	0	8.6E-02	3.6E-02	7.6E-01	8.1E-01	4.9E+00	2.1E+00	4.8E+01	5.1E+01	2.2E+02	9.0E-03	7.6E-02	8.1E-02	1.2E+00	5.1E+00	1.2E+00	5.1E+00	4.8E+00	5.1E+00	4.8E+00	5.1E+00	
Endrin Aldehyde	0	-	-	-	7.6E-01	8.1E-01	-	-	4.8E+01	5.1E+01	-	-	7.6E-02	8.1E-02	-	-	4.8E+00	5.1E+00	-	-	4.8E+00	5.1E+00
(ppq)	0	-	-	-	1.2E-06	1.2E-08	-	-	1.2E-06	1.2E-06	-	-	1.2E-07	1.2E-07	-	-	1.2E-07	1.2E-07	-	-	1.2E-07	1.2E-07
1,2-Diphenylhydrazine <sup>c</sup>	0	-	-	-	4.0E-01	5.4E-00	-	-	3.1E+01	4.2E+02	-	-	4.0E-02	5.4E-01	-	-	3.1E+00	4.2E+01	-	-	3.1E+00	4.2E+01
Alpha-Endosulfan	0	2.2E-01	5.6E-02	1.1E+02	2.4E+02	1.3E+01	3.2E+00	7.0E+03	1.5E+04	5.5E+02	1.4E-02	1.1E+01	2.4E+01	3.1E+00	7.0E+02	1.5E+03	3.1E+00	8.0E-01	7.0E+02	1.5E+03	3.1E+00	8.0E-01
Beta-Endosulfan	0	2.2E-01	5.6E-02	1.1E+02	2.4E+02	1.3E+01	3.2E+00	7.0E+03	1.5E+04	5.5E+02	1.4E-02	1.1E+01	2.4E+01	3.1E+00	7.0E+02	1.5E+03	3.1E+00	8.0E-01	7.0E+02	1.5E+03	3.1E+00	8.0E-01
2-Methyl-4,6-Dinitrophenol	0	-	-	-	1.1E+02	2.4E+02	-	-	7.0E+03	1.5E+04	-	-	1.1E+01	2.4E+01	-	-	7.0E+02	1.5E+03	-	-	7.0E+02	1.5E+03
2,4-Dinitrotoluene <sup>c</sup>	0	-	-	-	1.1E+00	9.1E+01	-	-	8.6E+01	7.1E+03	-	-	1.1E+01	9.1E+00	-	-	8.6E+00	7.1E+02	-	-	8.6E+00	7.1E+02
Dioxin (2,3,7,8-tetrachlorobiphenol-p-dioxin)	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

Parameter (ug/l unless noted)	Background Conc.	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations				
		Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	
Ethylbenzene	0	--	--	3.1E-03	2.9E-04	--	--	2.0E-05	1.8E-06	--	--	3.1E+02	2.9E+03	--	--	2.0E+04	1.8E+05	--	--	2.0E-04	1.8E-06	
Fluoranthene	0	--	--	3.0E+02	3.7E+02	--	--	1.9E+04	2.3E+04	--	--	3.0E+01	3.7E+01	--	--	1.9E+03	2.3E+03	--	--	1.9E+03	2.3E+03	
Fluorene	0	--	--	1.3E+03	1.4E+04	--	--	8.3E+04	6.9E+05	--	--	1.3E+02	1.4E+03	--	--	8.3E+03	8.9E+04	--	--	8.3E+03	8.9E+04	
Foaming Agents	0	--	--	5.0E+02	--	--	--	3.2E+04	--	--	--	5.0E+01	--	--	--	3.2E+03	--	--	--	3.2E+03	--	
Guthion	0	--	1.0E-02	--	--	5.7E-01	--	--	--	2.5E-03	--	--	--	1.4E-01	--	--	--	1.4E-01	--	--	--	
Heptachlor	c	0	5.2E-01	3.8E-03	2.1E-03	2.1E-03	3.0E+01	2.2E+01	7.8E-02	8.6E-02	1.3E-01	9.5E-04	2.1E-04	2.1E-04	7.4E+00	5.4E+00	1.6E-02	1.6E-02	1.6E-02	1.6E-02		
Heptachlor Epoxide	c	0	5.2E-01	3.8E-03	1.0E-03	1.1E-03	3.0E+01	2.2E+01	7.8E-02	8.6E-02	1.0E-04	1.1E-04	7.4E+00	5.4E+00	1.6E-02	1.6E-02	7.4E+00	5.4E+02	7.8E+03	8.6E+03		
Hexachlorobenzene	c	0	--	--	7.5E-03	7.7E-03	--	--	5.9E-01	6.0E-01	--	--	7.5E-04	7.7E-04	--	--	5.9E-02	6.0E-02	--	--	5.9E-02	6.0E-02
Hexachlorobutadiene	c	0	--	--	4.4E+00	5.0E+02	--	--	3.4E+02	3.9E+04	--	--	4.4E-01	6.0E+01	--	--	3.4E+01	3.9E+03	--	--	3.4E+01	3.9E+03
Hexachlorocyclohexane	c	0	--	--	3.9E-02	1.3E-01	--	--	3.0E+00	1.0E+01	--	--	3.9E-03	1.3E-02	--	--	3.0E-01	1.0E+00	--	--	3.0E-01	1.0E+00
Alpha-BHC	c	0	--	--	1.4E-01	4.6E-01	--	--	1.1E+01	3.6E+01	--	--	1.4E-02	4.6E-02	--	--	1.1E+00	3.6E+00	--	--	1.1E+00	3.6E+00
Beta-BHC	c	0	--	--	1.9E-01	8.9E-01	--	--	1.5E+03	6.9E+03	--	--	1.9E+00	8.9E+00	--	--	1.5E+02	6.9E+02	--	--	1.5E+02	6.9E+02
Hexachlorocyclohexane	c	0	--	--	2.4E+02	1.7E+04	--	--	1.5E+04	1.1E+06	--	--	2.4E+01	1.7E+03	--	--	1.5E+03	1.1E+05	--	--	1.5E+03	1.1E+05
Gamma-BHC (Indane)	c	0	8.5E-01	--	1.9E-01	6.3E-01	5.4E+01	--	1.5E+01	4.9E+01	2.4E+01	--	1.9E-02	6.3E-02	1.4E+01	--	1.5E+00	4.9E+00	1.4E+01	--	1.5E+00	4.9E+00
Hexachlorocyclopentadiene	c	0	--	--	4.4E-02	4.9E-01	--	--	3.4E+00	3.8E+01	--	--	4.4E-03	4.9E-02	--	--	3.4E-01	3.8E+00	--	--	3.4E-01	3.8E+00
Hexachloroethane	c	0	--	--	1.9E+00	1.1E+02	--	--	1.5E+03	6.9E+03	--	--	1.9E+00	8.9E+00	--	--	1.5E+02	6.9E+02	--	--	1.5E+02	6.9E+02
Hydrogen Sulfide	c	0	--	--	4.4E-02	4.9E-01	--	--	3.4E+00	3.8E+01	--	--	4.4E-03	4.9E-02	--	--	2.9E+01	--	--	--	2.9E+01	--
Indeno (1,2,3-cd) pyrene	c	0	--	--	3.0E+02	--	--	--	1.9E+04	--	--	--	3.0E+01	--	--	--	1.9E+03	--	--	--	1.9E+03	--
Iron	c	0	--	--	3.6E+02	2.6E+04	--	--	2.8E+04	2.0E+06	--	--	3.6E+01	2.6E+03	--	--	2.8E+03	2.0E+05	--	--	2.8E+03	2.0E+05
Tsophorone	c	0	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--
Keprone	c	0	--	--	1.9E+02	2.1E+01	--	--	1.1E+04	1.2E+03	9.5E+02	--	4.7E+01	5.4E+00	1.5E+00	--	2.7E+03	3.1E+03	9.5E+01	--	2.7E+03	3.1E+03
Lead	c	0	--	--	1.0E-01	--	--	--	5.7E+00	--	--	--	2.5E-02	--	--	--	1.4E+00	--	--	--	1.4E+00	--
Malathion	c	0	--	--	5.0E+01	--	--	--	0.0E+00	--	--	--	5.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--
Manganese	c	0	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	3.2E+02	--	--	--	3.2E+02	--
Mercury	c	0	1.4E+00	7.7E+01	5.0E-02	5.1E-02	8.0E+01	4.4E+01	3.2E+00	3.2E+00	3.5E-01	1.9E-01	5.0E-03	5.1E-03	2.0E+01	1.1E+01	3.2E+01	2.0E+01	1.1E+01	3.2E+01	3.2E+01	
Methyl Bromide	c	0	--	--	4.8E+01	4.0E-03	--	--	3.0E+03	2.5E+05	--	--	4.8E+00	4.0E+02	--	--	3.0E+02	2.5E+04	--	--	3.0E+02	2.5E+04
Methoxychlor	c	0	--	--	3.0E+02	1.0E+02	--	--	1.7E+00	6.4E+03	--	--	7.5E-03	1.0E+01	--	--	4.3E-01	6.4E+02	--	--	4.3E-01	6.4E+02
Mirex	c	0	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--
Monochlorobenzene	c	0	--	--	6.8E+02	2.1E+04	--	--	4.3E+04	1.3E+06	--	--	6.8E+01	2.1E+03	--	--	4.3E+03	1.3E+05	--	--	4.3E+03	1.3E+05
Nickel	c	0	2.5E+02	2.8E+01	6.1E+02	4.6E+03	1.4E+04	2.9E+03	6.2E+05	6.2E+05	3.9E+01	6.1E+01	4.6E+02	3.6E+03	3.9E+02	3.9E+04	3.6E+03	3.9E+02	3.9E+03	3.9E+04	3.9E+04	
Nitrate (as N)	c	0	--	--	1.0E+04	--	--	--	6.4E+05	--	--	--	1.0E+03	--	--	--	6.4E+04	--	--	--	6.4E+04	--
Nitrobenzene	c	0	--	--	1.7E+01	1.9E+03	--	--	1.1E+03	1.2E+05	--	--	1.7E+00	1.9E+02	--	--	1.1E+02	1.2E+04	--	--	1.1E+02	1.2E+04
N-Nitrosodimethylamine	c	0	--	--	6.9E-03	8.1E+01	--	--	5.4E-01	6.3E+03	--	--	6.9E-04	8.1E+00	--	--	5.4E-02	6.3E+02	--	--	5.4E-02	6.3E+02
N-Nitrosodiphenylamine	c	0	--	--	5.0E+01	1.6E+02	--	--	3.9E+03	1.2E+04	--	--	5.0E+00	1.6E+01	--	--	3.9E+02	1.2E+03	--	--	3.9E+02	1.2E+03
Parathion	c	0	--	--	1.3E+02	--	--	3.7E+00	7.4E+01	--	--	1.6E-02	3.3E+03	--	--	9.3E-01	1.9E+01	--	--	9.3E-01	1.9E+01	
PCB-1016	c	0	--	--	1.4E-02	--	--	--	8.0E-01	--	--	--	3.5E-03	--	--	--	2.0E-01	--	--	--	2.0E-01	--
PCB-1221	c	0	--	--	1.4E-02	--	--	--	8.0E-01	--	--	--	3.5E-03	--	--	--	2.0E-01	--	--	--	2.0E-01	--
PCB-1232	c	0	--	--	1.4E-02	--	--	--	8.0E-01	--	--	--	3.5E-03	--	--	--	2.0E-01	--	--	--	2.0E-01	--
PCB-1242	c	0	--	--	1.4E-02	--	--	--	8.0E-01	--	--	--	3.5E-03	--	--	--	2.0E-01	--	--	--	2.0E-01	--
PCB-1248	c	0	--	--	1.4E-02	--	--	--	8.0E-01	--	--	--	3.5E-03	--	--	--	2.0E-01	--	--	--	2.0E-01	--
PCB-1254	c	0	--	--	1.4E-02	--	--	--	8.0E-01	--	--	--	3.5E-03	--	--	--	2.0E-01	--	--	--	2.0E-01	--
PCB-1260	c	0	--	--	1.4E-02	--	--	--	8.0E-01	--	--	--	3.5E-03	--	--	--	2.0E-01	--	--	--	2.0E-01	--
PCB Total	c	0	--	--	1.7E-03	1.7E-03	--	--	1.3E-01	1.3E-01	--	--	1.7E-04	1.7E-04	--	--	1.3E-02	1.3E-02	--	--	1.3E-02	1.3E-02

Parameter (ug/l unless noted)	Background Conc.	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations				
		Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	
Pentachlorophenol <sup>c</sup>	0	8.7E+00	6.7E+00	2.8E+00	8.2E+01	5.0E+02	3.8E+02	2.2E+02	6.4E+02	2.2E+00	1.7E+00	2.8E+01	8.2E+00	1.2E+02	9.6E+01	2.2E+02	9.6E+01	2.2E+01	9.6E+01	2.2E+02	6.4E+02	
Phenol	0	-	-	2.1E+04	4.6E+06	-	-	1.3E+06	2.9E+08	-	-	2.1E+03	4.6E+05	-	-	1.3E+05	2.9E+07	-	-	1.3E+05	2.9E+07	
Pyrene	0	-	-	9.6E+02	1.1E+04	-	-	6.1E+04	7.0E+05	-	-	9.6E+01	1.1E+03	-	-	6.1E+03	7.0E+04	-	-	6.1E+03	7.0E+04	
Radionuclides (PCM except Beta/Photon)	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Gross Alpha Activity	0	-	-	1.5E+01	1.5E+01	-	-	9.5E+02	9.5E+02	-	-	1.5E+00	1.5E+00	-	-	9.5E+01	9.5E+01	-	-	9.5E+01	9.5E+01	
Beta and Photon Activity (mrem/yr)	0	-	-	4.0E+00	4.0E+00	-	-	2.5E+02	2.5E+02	-	-	4.0E+01	4.0E+01	-	-	2.5E+01	2.5E+01	-	-	2.5E+01	2.5E+01	
Sodium <sup>b</sup>	0	-	-	8.0E+00	8.0E+00	-	-	5.1E+02	5.1E+02	-	-	8.0E+01	8.0E+01	-	-	5.1E+01	5.1E+01	-	-	5.1E+01	5.1E+01	
Strontium-90	0	-	-	2.0E+04	2.0E+04	-	-	1.3E+06	1.3E+06	-	-	2.0E+03	2.0E+03	-	-	1.3E+05	1.3E+05	-	-	1.3E+05	1.3E+05	
Tritium	0	-	-	5.0E+00	1.1E+04	-	-	2.9E+02	1.1E+04	7.0E+05	5.0E+00	1.3E+00	1.7E+01	1.1E+03	2.9E+02	7.2E+01	1.1E+03	2.9E+02	7.2E+01	1.1E+03	7.0E+04	
Selenium	0	2.0E+01	5.0E+00	1.7E+02	6.3E+00	-	-	3.7E+02	3.7E+02	-	-	1.6E+00	-	-	-	9.2E+01	-	-	-	9.2E+01	-	-
Silver	0	6.3E+00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Sulfate	0	-	-	2.5E+05	... <sup>a</sup>	-	-	1.6E+07	-	-	-	2.5E+04	-	-	-	1.6E+06	-	-	-	1.6E+06	-	-
-1,1,2,2-Tetrachloroethane <sup>c</sup>	0	-	-	1.7E+00	1.1E+02	-	-	1.3E+02	8.6E+03	-	-	1.7E+01	1.1E+01	-	-	1.3E+01	8.6E+02	-	-	1.3E+01	8.6E+02	
-Tetrachloroethylene <sup>c</sup>	0	-	-	8.0E+00	8.9E+01	-	-	6.2E+02	6.9E+03	-	-	8.0E+01	8.9E+00	-	-	6.2E+01	6.9E+02	-	-	6.2E+01	6.9E+02	
Thallium	0	-	-	1.7E+00	6.3E+00	-	-	1.1E+02	4.0E+02	-	-	1.7E+01	6.3E+01	-	-	1.1E+01	4.0E+01	-	-	1.1E+01	4.0E+01	
Toluene	0	-	-	6.8E+03	2.0E+05	-	-	4.3E+05	1.3E+07	-	-	6.8E+02	2.0E+04	-	-	4.3E+04	1.3E+06	-	-	4.3E+04	1.3E+06	
Total dissolved solids	0	-	-	5.0E+05	-	-	-	3.2E+07	-	-	-	5.0E+04	-	-	-	3.2E+06	-	-	-	3.2E+06	-	-
Toxaphene <sup>c</sup>	0	7.3E+01	2.0E+04	7.3E+03	7.5E+03	4.2E+01	1.1E+02	5.7E+01	5.9E+01	1.8E+01	5.0E+05	7.3E+04	7.5E+04	1.0E+01	2.9E+03	5.7E+02	5.9E+02	5.7E+02	5.9E+02	5.7E+02	5.9E+02	
Tributyltin	0	4.6E+01	6.3E+02	-	-	2.6E+01	3.6E+00	-	-	1.2E+01	1.6E+02	-	-	6.6E+00	9.0E+01	-	-	6.6E+00	9.0E+01	-	-	
1,2,4-Trichlorobenzene	0	-	-	2.6E+02	9.4E+02	-	-	1.7E+04	6.0E+04	-	-	2.6E+01	9.4E+01	-	-	1.7E+03	6.0E+03	-	-	1.7E+03	6.0E+03	
1,1,2-Trichloroethane <sup>c</sup>	0	-	-	6.0E+00	4.2E+02	-	-	4.7E+02	3.3E+04	-	-	6.0E+01	4.2E+01	-	-	4.7E+01	3.3E+03	-	-	4.7E+01	3.3E+03	
Trichloroethylene <sup>c</sup>	0	-	-	2.7E+01	8.1E+02	-	-	2.1E+03	6.3E+04	-	-	2.7E+00	8.1E+01	-	-	2.1E+02	6.3E+03	-	-	2.1E+02	6.3E+03	
2,4,6-Trichlorophenol <sup>c</sup>	0	-	-	2.1E+01	6.5E+01	-	-	1.6E+03	5.1E+03	-	-	2.1E+00	6.5E+00	-	-	1.6E+02	5.1E+02	-	-	1.6E+02	5.1E+02	
2-(2,4,5-Trichlorophenoxy) proprionic acid (Silvex)	0	-	-	5.0E+01	-	-	-	3.2E+03	-	-	-	5.0E+00	-	-	-	3.2E+02	-	-	-	3.2E+02	-	-
Vinyl Chloride <sup>c</sup>	0	-	-	2.3E+01	6.1E+01	-	-	1.8E+01	4.8E+03	-	-	2.3E+02	6.1E+00	-	-	1.8E+00	4.8E+02	-	-	1.8E+00	4.8E+02	
Zinc	0	1.6E+02	1.6E+02	9.1E+03	6.9E+04	9.1E+03	9.2E+03	5.8E+05	4.4E+06	4.0E+01	4.0E+01	9.1E+02	6.9E+03	2.3E+03	2.3E+03	5.8E+04	5.8E+04	2.3E+03	5.8E+04	4.4E+06	4.4E+06	

## Notes:

- All concentrations expressed as micrograms/liter (ug/l), unless noted otherwise
- Discharge flow is highest monthly average or Form 2C maximum for industries and design flow for Municipal
- Metals measured as Dissolved, unless specified otherwise
- "C" indicates a carcinogenic parameter
- Regular WLAs are mass balances (minus background concentration) using the % of stream flow entered above under Mixing Information.
- Antidegradation WLAs are based upon a complete mix.
- Antideg. Baseline = (0.25(WQC - background conc.) + background conc.) for acute and chronic  
= (0.1(WQC - background conc.) + background conc.) for human health

Harmonic Mean for Carcinogens, and Annual Average for Dioxin. Mixing ratios may be substituted for stream flows where appropriate.

1. All concentrations expressed as micrograms/liter (ug/l), unless noted otherwise

2. Discharge flow is highest monthly average or Form 2C maximum for industries and design flow for Municipal

3. Metals measured as Dissolved, unless specified otherwise

4. "C" indicates a carcinogenic parameter

5. Regular WLAs are mass balances (minus background concentration) using the % of stream flow entered above under Mixing Information.

6. Antideg. Baseline = (0.25(WQC - background conc.) + background conc.) for acute and chronic  
= (0.1(WQC - background conc.) + background conc.) for human health

7. WLAs established at the following stream flows: 1Q10 for Acute, 3Q10 for Chronic Ammonia, 7Q10 for Other Chronic, 3Q05 for Non-carcinogens.

Metal	Target Value (SSTV)
Antimony	8.9E+01
Arsenic	6.4E+01
Barium	1.3E+04
Cadmium	1.3E+01
Chromium III	8.6E+02
Chromium VI	9.2E+01
Copper	1.1E+02
Iron	1.9E+03
Lead	9.5E+01
Manganese	3.2E+02
Mercury	3.2E+01
Nickel	2.4E+02
Selenium	4.3E+01
Silver	3.7E+01
Zinc	9.1E+02

Note: do not use QL's lower than the minimum QL's provided in agency guidance

## 0.005 MGD DISCHARGE FLOW - STREAM MIX PER "Mix.exe"

Discharge Flow Used for WQS-WLA Calculations (MGD)		0.005			
Stream Flows Allocated to Mix (MGD)		Total Mix Flows Stream + Discharge (MGD)			
Dry Season	Wet Season	Dry Season	Wet Season	Dry Season	Wet Season
1Q10	0.270	0.320	0.275	0.325	
7Q10	0.270	N/A	0.275	N/A	
30Q10	0.280	0.340	0.285	0.345	
30Q5	0.300	N/A	0.305	N/A	
Harm. Mean	0.370	N/A	0.375	N/A	
Annual Avg.	0.000	N/A	0.005	N/A	

Stream/Discharge Mix Values		Dry Season		Wet Season	
1Q10 90th% Temp. Mix (deg C)		25,000	12,094		
30Q10 90th% Temp. Mix (deg C)		25,000	12,082		
1Q10 90th% pH Mix (SU)		8.171	8.175		
30Q10 90th% pH Mix (SU)		8.172	8.176		
1Q10 10th% pH Mix (SU)		7,000	N/A		
7Q10 10th% pH Mix (SU)		7,000	N/A		

Calculated Formula Inputs			
1Q10 Hardness (mg/L as CaCO <sub>3</sub> )	144.0	144.0	
7Q10 Hardness (mg/L as CaCO <sub>3</sub> )	144.0	144.0	

Ammonia - Dry Season - Chronic		Ammonia - Wet Season - Chronic	
90th Percentile pH (SU)	8.171	90th Percentile Temp. (deg C)	25,000
(7.204 - pH) (pH - 7.204)	-0.967	90th Percentile pH (SU)	8.172
	0.967	MIN	1.450
		MAX	25,000
		(7.688 - pH) (pH - 7.688)	-0.484
			0.484
Trout Present Criterion (mg N/L)	4.050	Early LS Present Criterion (mg N/L)	0.954
Trout Absent Criterion (mg N/L)	6.063	Early LS Absent Criterion (mg N/L)	0.954
Trout Present?	n	Early Life Stages Present?	y
Effective Criterion (mg N/L)	6.063	Effective Criterion (mg N/L)	0.954

Ammonia - Dry Season - Acute		Ammonia - Wet Season - Acute	
90th Percentile pH (SU)	8.171	90th Percentile Temp. (deg C)	12,082
(7.204 - pH) (pH - 7.204)	-0.971	90th Percentile pH (SU)	8.176
	0.971	MIN	2,850
		MAX	12,082
Trout Present Criterion (mg N/L)	4.015	(7.688 - pH) (pH - 7.688)	-0.488
Trout Absent Criterion (mg N/L)	6.012		0.488
Trout Present?	n		
Effective Criterion (mg N/L)	6.012		

## 0.005 MGD DISCHARGE FLOW - COMPLETE STREAM MIX

Discharge Flow Used for WQS-WLA Calculations (MGD)		Ammonia - Dry Season - Acute		Ammonia - Dry Season - Chronic	
100% Stream Flows Allocated to Mix (MGD)	Total Mix Flows Stream + Discharge (MGD)	90th Percentile pH (SU) (7.204 - pH) (pH - 7.204)	90th Percentile Temp. (deg C)	90th Percentile pH (SU)	90th Percentile Temp. (deg C)
Dry Season	Wet Season	Dry Season	Wet Season	Dry Season	Wet Season
1Q10 0.270	0.320	0.275	0.325	Trout Present Criterion (mg N/L)	4.050
7Q10 0.270	N/A	0.275	N/A	Trout Absent Criterion (mg N/L)	6.063
30Q10 0.280	0.340	0.285	0.345	Trout Present?	n
30Q5 0.300	N/A	0.305	N/A	Effective Criterion (mg N/L)	6.063
Harm. Mean 0.370	N/A	0.375	N/A		
Annual Avg. 0.000	N/A	0.005	N/A		
Stream/Discharge Mix Values					
Dry Season	Wet Season	Dry Season	Wet Season	Dry Season	Wet Season
1Q10 90th% Temp. Mix (deg C)	25.000	12.094	90th Percentile pH (SU) (7.204 - pH) (pH - 7.204)	8.175	90th Percentile Temp. (deg C)
30Q10 90th% Temp. Mix (deg C)	25.000	12.082		-0.971	90th Percentile pH (SU)
1Q10 90th% pH Mix (SU)	8.171	8.175		0.971	90th Percentile Temp. (deg C)
30Q10 90th% pH Mix (SU)	8.172	8.176		MAX	90th Percentile pH (SU)
1Q10 10th% pH Mix (SU)	7.000	N/A		(7.688 - pH) (pH - 7.688)	90th Percentile Temp. (deg C)
7Q10 10th% pH Mix (SU)	7.000	N/A			90th Percentile pH (SU)
Calculated Formula Inputs	144.000	144.000			
1Q10 Hardness (mg/L as CaCO <sub>3</sub> )	144.000	144.000			
7Q10 Hardness (mg/L as CaCO <sub>3</sub> )					
Ammonia - Wet Season - Acute					
Dry Season	Wet Season	Dry Season	Wet Season	Dry Season	Wet Season
1Q10 90th% Temp. Mix (deg C)	25.000	12.094	90th Percentile pH (SU) (7.204 - pH) (pH - 7.204)	8.175	90th Percentile Temp. (deg C)
30Q10 90th% Temp. Mix (deg C)	25.000	12.082		-0.971	90th Percentile pH (SU)
1Q10 90th% pH Mix (SU)	8.171	8.175		0.971	90th Percentile Temp. (deg C)
30Q10 90th% pH Mix (SU)	8.172	8.176		MAX	90th Percentile pH (SU)
1Q10 10th% pH Mix (SU)	7.000	N/A		(7.688 - pH) (pH - 7.688)	90th Percentile Temp. (deg C)
7Q10 10th% pH Mix (SU)	7.000	N/A			90th Percentile pH (SU)
Calculated Formula Inputs	144.000	144.000			
1Q10 Hardness (mg/L as CaCO <sub>3</sub> )	144.000	144.000			
7Q10 Hardness (mg/L as CaCO <sub>3</sub> )					
Ammonia - Wet Season - Chronic					
Dry Season	Wet Season	Dry Season	Wet Season	Dry Season	Wet Season
1Q10 90th% Temp. Mix (deg C)	25.000	12.094	90th Percentile pH (SU) (7.204 - pH) (pH - 7.204)	8.175	90th Percentile Temp. (deg C)
30Q10 90th% Temp. Mix (deg C)	25.000	12.082		-0.971	90th Percentile pH (SU)
1Q10 90th% pH Mix (SU)	8.171	8.175		0.971	90th Percentile Temp. (deg C)
30Q10 90th% pH Mix (SU)	8.172	8.176		MAX	90th Percentile pH (SU)
1Q10 10th% pH Mix (SU)	7.000	N/A		(7.688 - pH) (pH - 7.688)	90th Percentile Temp. (deg C)
7Q10 10th% pH Mix (SU)	7.000	N/A			90th Percentile pH (SU)
Calculated Formula Inputs	144.000	144.000			
1Q10 Hardness (mg/L as CaCO <sub>3</sub> )	144.000	144.000			
7Q10 Hardness (mg/L as CaCO <sub>3</sub> )					

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Facility = Woodhaven Nursing Home WWTP  
Chemical = TRC (ug/L) 0.0048 MGD  
Chronic averaging period = 4  
WLAa = 270  
WLAc = 160  
Q.L. = 100  
# samples/mo. = 30  
# samples/wk. = 8

Summary of Statistics:

# observations = 1  
Expected Value = 1000  
Variance = 360000  
C.V. = 0.6  
97th percentile daily values = 2433.41  
97th percentile 4 day average = 1663.79  
97th percentile 30 day average= 1206.05  
# < Q.L. = 0  
Model used = BPJ Assumptions, type 2 data

A limit is needed based on Chronic Toxicity  
Maximum Daily Limit = 234.011965448517  
Average Weekly limit = 139.589327552015  
Average Monthly LImit = 115.981282674557

The data are:

1000

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Facility = Woodhaven Nursing Home WWTP  
Chemical = ammonia (mg/L) 0.0048 MGD  
Chronic averaging period = 30  
WLAa = 55.62  
WLAc = 12.68  
Q.L. = 0.2  
# samples/mo. = 1  
# samples/wk. = 1

**Summary of Statistics:**

# observations = 1  
Expected Value = 9  
Variance = 29.16  
C.V. = 0.6  
97th percentile daily values = 21.9007  
97th percentile 4 day average = 14.9741  
97th percentile 30 day average= 10.8544  
# < Q.L. = 0  
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

**0.0066 MGD Facility**

# FRESHWATER WATER QUALITY CRITERIA / WASTELOAD ALLOCATION ANALYSIS

Facility Name: Woodhaven Nursing Home WWTP

Permit No.: VA0074840

Receiving Stream: South Fork Goose Creek, UT

Version: OWP Guidance Memo 00-2011 (8/24/00)

Stream Information		Stream Flows				Mixing Information				Effluent Information			
		1Q10 (Annual) =	0.27 MGD	Annual - 1Q10 Mix =	100 %	Mean Hardness (as CaCO <sub>3</sub> ) =	144 mg/L	90% Temp (Annual) =	100 %	90% Temp (Wet season) =	100 %	90% Temp (Wet season) =	25 deg C
Mean Hardness (as CaCO <sub>3</sub> ) =	144 mg/L	7Q10 (Annual) =	0.27 MGD	-7Q10 Mix =	100 %	90% Temp (Annual) =	25 deg C	90% Maximum pH =	100 %	90% Maximum pH =	100 %	90% Maximum pH =	25 deg C
90% Temperature (Annual) =	25 deg C	3Q10 (Annual) =	0.28 MGD	-3Q10 Mix =	100 %	7.5 SU	7 SU	7.5 SU	100 %	7.5 SU	100 %	7.5 SU	7 SU
90% Temperature (Wet season) =	11.9 deg C	1Q10 (Wet season) =	0.32 MGD	Wet Season - 1Q10 Mix =	100 %	7 SU	7 SU	7 SU	100 %	7 SU	100 %	7 SU	7 SU
90% Maximum pH =	8.2 SU	3Q10 (Wet season) =	0.34 MGD	-3Q10 Mix =	100 %	0.0066 MGD	0.0066 MGD	0.0066 MGD	100 %	0.0066 MGD	100 %	0.0066 MGD	0.0066 MGD
(10% Maximum pH =	7 SU	3Q05 =	0.3 MGD										
Tier Designation (1 or 2) =	2	Harmonic Mean =	0.37 MGD										
Public Water Supply (PWS) Y/N? =	y	Annual Average =	MGD										
Trout Present Y/N? =	n												
Early Life Stages Present Y/N? =	y												

Parameter (ug/l unless noted)	Background Conc.	Water Quality Criteria		Wasteload Allocations		Antidegradation Baseline		Antidegradation Allocations		Acute		Chronic		Most Limiting Allocations			
		Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Acenaphthene	0	--	--	1.2E+03	2.7E+03	--	--	5.6E+04	1.3E+04	--	--	5.6E+03	1.3E+04	--	--	5.6E+03	1.3E+04
Acrolein	0	--	--	3.2E+02	7.8E+02	--	--	1.5E+04	3.6E+03	--	--	1.5E+03	3.6E+03	--	--	1.5E+03	3.6E+03
Acrylonitrile <sup>c</sup>	0	--	--	5.9E-01	6.6E+00	--	--	3.4E+01	3.8E+02	--	--	3.4E+00	3.8E+01	--	--	3.4E+00	3.8E+01
Aldrin <sup>c</sup>	0	3.0E+00	--	1.3E-03	1.4E-03	1.3E+02	--	7.4E-02	8.0E-02	7.5E-01	--	1.3E-04	1.4E-04	3.1E+01	--	3.1E+01	8.0E-03
Ammonia-N (mg/l) (Yearly)	0	6.19E+00	9.70E-01	--	--	2.6E+02	4.2E+01	--	--	1.55E+00	2.42E-01	--	--	6.5E+01	1.1E+01	--	--
Ammonia-N (mg/l) (High Flow)	0	6.12E+00	1.89E+00	--	--	3.0E+02	9.9E+01	--	--	1.53E+00	4.72E-01	--	--	7.6E+01	2.5E+01	--	--
Anthracene	0	--	--	9.6E+03	1.1E+05	--	--	4.5E+05	5.1E+06	--	--	4.5E+04	5.1E+05	--	--	4.5E+04	5.1E+05
Antimony	0	--	--	1.4E+01	4.3E+03	--	--	6.5E+02	2.0E+05	--	--	1.4E+00	4.3E+02	--	--	6.5E+01	2.0E+03
Arsenic	0	3.4E+02	1.5E+02	1.0E+01	--	1.4E+04	6.3E+03	4.6E+02	--	8.5E+01	3.8E+01	1.0E+00	--	3.6E+03	1.6E+03	4.6E+01	--
Barium	0	--	--	2.0E+03	--	--	--	9.3E+04	--	--	--	2.0E+02	--	--	9.3E+03	--	--
Benzene <sup>c</sup>	0	--	--	1.2E+01	7.1E+02	--	--	6.8E+02	4.1E+04	--	--	1.2E+00	7.1E+01	--	--	6.8E+01	4.1E+03
Benzidine <sup>c</sup>	0	--	--	1.2E-03	5.4E-03	--	--	6.8E-02	3.1E-01	--	--	1.2E-04	5.4E-04	--	--	6.8E-03	3.1E-02
Benzo (a) anthracene <sup>c</sup>	0	--	--	4.4E-02	4.9E-01	--	--	2.5E+00	2.8E+01	--	--	4.4E-03	4.9E-02	--	--	2.5E-01	2.8E+00
Benzo (b) fluoranthene <sup>c</sup>	0	--	--	4.4E-02	4.9E-01	--	--	2.5E+00	2.8E+01	--	--	4.4E-03	4.9E-02	--	--	2.5E-01	2.8E+00
Benzo (K) fluoranthene <sup>c</sup>	0	--	--	4.4E-02	4.9E-01	--	--	2.5E+00	2.8E+01	--	--	4.4E-03	4.9E-02	--	--	2.5E-01	2.8E+00
Benzo (a) pyrene <sup>c</sup>	0	--	--	4.4E-02	4.9E-01	--	--	2.5E+00	2.8E+01	--	--	4.4E-03	4.9E-02	--	--	2.5E-01	2.8E+00
Bis(2-Chloroethyl) Ether	0	--	--	1.4E+01	1.4E+01	--	--	1.4E+01	6.5E+02	--	--	3.1E-02	1.4E+00	--	--	1.4E+00	6.5E+01
Bis(2-Chloroethyl) Ether	0	--	--	1.4E+03	1.7E+05	--	--	6.5E+04	7.9E+06	--	--	1.4E+02	1.7E+04	--	--	6.5E+03	7.9E+05
Bronform <sup>c</sup>	0	--	--	4.4E+01	3.6E+03	--	--	2.5E+03	2.1E+05	--	--	4.4E+00	3.6E+02	--	--	2.5E+02	2.1E+04
Butylbenzylphthalate	0	--	--	3.0E+03	5.2E+03	--	--	1.4E+05	2.4E+05	--	--	3.0E+02	5.2E+02	--	--	1.4E+04	2.4E+04
Cadmium	0	5.9E+00	1.5E+00	5.0E+00	--	2.5E+02	6.3E+01	2.3E+02	--	1.5E+00	3.8E+01	5.0E+01	--	6.2E+01	1.6E+01	2.3E+01	--
Carbon Tetrachlride <sup>c</sup>	0	--	--	2.5E+00	4.4E+01	--	--	1.4E+02	2.5E+03	--	--	2.5E+01	4.4E+00	--	--	1.4E+01	2.5E+02
Chlordane <sup>c</sup>	0	2.4E+00	4.3E+03	2.1E+02	2.2E+02	1.0E+02	1.8E+01	1.2E+00	6.0E+01	1.1E-03	2.2E+03	2.5E+01	4.5E-02	1.2E+01	1.3E-01	2.5E+01	4.5E-02
Chloride	0	8.6E+05	2.3E+05	2.5E+05	--	3.6E+07	9.6E+06	1.2E+07	--	2.2E+06	5.8E+04	2.5E+04	--	9.0E+06	2.4E+06	1.2E+06	--
TRC	0	1.9E+01	1.1E+01	--	--	8.0E+02	4.6E+02	--	--	4.8E+00	2.8E+00	--	--	2.0E+02	1.2E+02	--	--
Chlorobenzene	0	--	--	6.8E+02	2.1E+04	--	--	3.2E+04	9.8E+05	--	--	6.8E+01	2.1E+03	--	--	3.2E+03	9.8E+04

Parameter (ug/l unless noted)	Background Conc.	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations				
		Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	
Chlorodibromomethane <sup>c</sup>	0	-	-	4.1E+00	3.4E+02	-	-	2.3E+02	1.9E+04	-	-	4.1E+01	3.4E+01	-	-	2.3E+01	1.9E+03	-	-	2.3E+01	1.9E+03	
Chloroform <sup>c</sup>	0	-	-	3.5E+02	2.9E+04	-	-	2.0E+04	1.7E+06	-	-	3.5E+01	2.9E+03	-	-	2.0E+03	1.7E+05	-	-	2.0E+03	1.7E+05	
2-Chloronaphthalene	0	-	-	1.7E+03	4.3E+03	-	-	7.9E+04	2.0E+06	-	-	1.7E+02	4.3E+02	-	-	7.9E+03	2.0E+04	-	-	7.9E+03	2.0E+04	
2-Chlorophenol	0	-	-	1.2E+02	4.0E+02	-	-	5.6E+03	1.9E+04	-	-	1.2E+01	4.0E+01	-	-	5.6E+02	1.9E+03	-	-	5.6E+02	1.9E+03	
Chlorpyrifos	0	8.3E-02	4.1E-02	-	-	3.5E+00	1.7E+00	-	-	2.1E-02	1.0E+02	-	-	8.1E-01	4.3E+01	-	-	8.7E-01	4.3E+01	-	-	
Chromium III	0	7.7E+02	1.0E+02	-	-	3.2E+04	4.2E+03	-	-	1.9E+02	2.5E+01	-	-	8.0E+03	1.0E+03	-	-	8.0E+03	1.0E+03	-	-	
Chromium, Total	0	-	-	1.0E+02	-	-	-	4.0E+00	2.8E+00	-	-	1.0E+01	-	-	-	4.6E+02	-	-	-	4.6E+02	-	-
Chrysene <sup>c</sup>	0	-	-	4.4E-02	4.9E-01	-	-	2.5E+00	2.8E+01	-	-	4.4E+03	4.9E+02	-	-	2.5E+01	2.8E+00	-	-	2.5E+01	2.8E+00	
Copper	0	1.9E+01	1.2E+01	-	-	7.9E+02	5.1E+02	6.0E+04	-	4.7E+00	3.1E+00	1.3E+02	-	2.0E+02	1.3E+02	6.0E+03	-	2.0E+02	1.3E+02	6.0E+03	-	
Cyanide	0	2.2E+01	5.2E+00	7.0E+02	2.2E+05	9.2E+02	2.2E+02	3.3E+04	1.0E+07	5.5E+00	1.3E+00	7.0E+01	2.2E+04	2.3E+02	5.4E+01	3.3E+03	1.0E+06	2.3E+02	5.4E+01	3.3E+03	1.0E+06	
DDD <sup>c</sup>	0	-	-	8.3E-03	8.4E-03	-	-	4.7E-01	4.8E-01	-	-	8.3E-04	8.4E-04	-	-	4.7E-02	4.8E-02	-	-	4.7E-02	4.8E-02	-
DDDE <sup>c</sup>	0	-	-	5.9E-03	5.9E-03	-	-	3.4E-01	3.4E-01	-	-	5.9E-04	5.9E-04	-	-	3.4E-02	3.4E-02	-	-	3.4E-02	3.4E-02	-
DDT <sup>c</sup>	0	-	-	1.0E+00	1.0E-03	4.6E+01	4.2E+02	3.4E-01	2.8E-01	2.5E-04	5.9E-04	1.2E+01	1.0E-02	3.4E-02	1.2E+01	1.0E-02	3.4E-02	1.0E-00	-	-	-	
Demeton	0	-	-	1.0E-01	-	-	-	4.2E+00	-	-	-	2.5E-02	-	-	-	1.0E+00	-	-	-	1.0E+00	-	-
Dibenzo(a,h)anthracene <sup>c</sup>	0	-	-	4.4E-02	4.9E-01	-	-	2.5E+00	2.8E+01	-	-	4.4E-03	4.9E-02	-	-	2.5E-01	2.8E+00	-	-	2.5E-01	2.8E+00	-
Diethyl phthalate	0	-	-	2.7E+03	1.2E+04	-	-	1.3E+05	5.6E+05	-	-	2.7E+02	1.2E+03	-	-	1.3E+04	5.6E+04	-	-	1.3E+04	5.6E+04	
Dichloromethane	0	-	-	4.7E+01	1.6E+04	-	-	2.7E+03	9.1E+05	-	-	4.7E+00	1.6E+03	-	-	2.7E+02	9.1E+04	-	-	2.7E+02	9.1E+04	
(Methylene Chloride) <sup>c</sup>	0	-	-	2.7E+03	1.7E+04	-	-	1.3E+05	7.9E+05	-	-	2.7E+02	1.7E+03	-	-	1.3E+04	7.9E+04	-	-	1.3E+04	7.9E+04	
1,2-Dichlorobenzene	0	-	-	4.0E+02	2.6E+03	-	-	1.9E+04	1.2E+05	-	-	4.0E+01	2.6E+02	-	-	1.9E+03	1.2E+04	-	-	1.9E+03	1.2E+04	
1,3-Dichlorobenzene	0	-	-	4.0E+02	2.6E+03	-	-	1.9E+04	1.2E+05	-	-	4.0E+01	2.6E+02	-	-	1.9E+03	1.2E+04	-	-	1.9E+03	1.2E+04	
1,4-Dichlorobenzene	0	-	-	4.0E+02	2.6E+03	-	-	1.9E+04	1.2E+05	-	-	4.0E+01	2.6E+02	-	-	1.9E+03	1.2E+04	-	-	1.9E+03	1.2E+04	
3,3-Dichlorobenzidine <sup>c</sup>	0	-	-	4.0E-01	7.7E-01	-	-	2.3E+01	4.4E-01	-	-	4.0E-02	7.7E-02	-	-	2.3E+00	4.4E+00	-	-	2.3E+00	4.4E+00	
Dichlorodromomethane <sup>c</sup>	0	-	-	5.6E+00	4.6E+02	-	-	3.2E+02	2.6E+04	-	-	5.6E+01	4.6E+01	-	-	3.2E+01	2.6E+03	-	-	3.2E+01	2.6E+03	
1,2-Dichloroethane <sup>c</sup>	0	-	-	3.8E+00	9.9E+02	-	-	2.2E+02	5.6E+04	-	-	3.8E-01	9.9E+01	-	-	2.2E+01	5.6E+03	-	-	2.2E+01	5.6E+03	
1,1-Dichloroethylene	0	-	-	3.1E+02	1.7E+04	-	-	1.4E+04	7.9E+05	-	-	3.1E+01	1.7E+03	-	-	1.4E+03	7.9E+04	-	-	1.4E+03	7.9E+04	
1,2-trans-dichloroethylene	0	-	-	7.0E+02	1.4E+05	-	-	3.3E+04	6.5E+06	-	-	7.0E+01	1.4E+04	-	-	3.3E+03	6.5E+05	-	-	3.3E+03	6.5E+05	
2,4-Dichlorophenol	0	-	-	9.3E+01	7.9E+02	-	-	4.3E+03	3.7E+04	-	-	9.3E+00	7.9E+01	-	-	4.3E+02	3.7E+03	-	-	4.3E+02	3.7E+03	
2,4-Dichlorophenoxy acetic acid (2,4-D)	0	-	-	1.0E+02	-	-	-	4.6E+03	-	-	-	1.0E+01	-	-	-	4.6E+02	-	-	-	4.6E+02	-	-
1,2-Dichloropropane	0	-	-	5.2E+00	3.9E+02	-	-	3.0E+02	2.2E+04	-	-	5.2E+01	3.9E+01	-	-	3.0E+01	2.2E+03	-	-	3.0E+01	2.2E+03	
1,3-Dichloropropene	0	-	-	1.0E+01	1.7E+03	-	-	4.6E+02	7.9E+04	-	-	1.0E+00	1.7E+02	-	-	4.6E+01	7.9E+03	-	-	4.6E+01	7.9E+03	
Dieldrin <sup>c</sup>	0	2.4E-01	5.6E-02	1.4E-03	1.0E+01	2.3E+00	8.0E-02	6.0E-02	1.4E-02	1.4E-04	1.4E-04	2.5E+00	5.9E-01	8.0E-03	2.6E+00	5.9E-01	8.0E-03	8.0E-03	8.0E-03	8.0E-03		
Dieldryl Phthalate	0	-	-	2.3E+04	1.2E+05	-	-	1.1E+06	5.6E+06	-	-	2.3E+03	1.2E+04	-	-	1.1E+05	5.6E+05	-	-	1.1E+05	5.6E+05	
Di-2-Ethylhexyl Phthalate <sup>c</sup>	0	-	-	1.8E+01	5.9E+01	-	-	1.0E+03	3.4E+03	-	-	1.8E+00	5.9E+00	-	-	1.0E+02	3.4E+02	-	-	1.0E+02	3.4E+02	
2,4-Dimethylphenol	0	-	-	5.4E+02	2.3E+03	-	-	2.5E+04	1.1E+05	-	-	5.4E+01	2.3E+02	-	-	2.5E+03	1.1E+04	-	-	2.5E+03	1.1E+04	
Dimethyl Phthalate	0	-	-	3.1E+05	2.9E+06	-	-	1.5E+07	1.3E+08	-	-	3.1E+04	2.9E+05	-	-	1.5E+06	1.3E+07	-	-	1.5E+06	1.3E+07	
Di-n-Butyl Phthalate	0	-	-	2.7E+03	1.2E+04	-	-	1.3E+05	5.6E+05	-	-	2.7E+02	1.2E+03	-	-	1.3E+04	5.6E+04	-	-	1.3E+04	5.6E+04	
2,4-Dinitrophenol	0	-	-	7.0E+01	1.4E+04	-	-	3.3E+03	6.5E+05	-	-	7.0E+00	1.4E+03	-	-	3.3E+02	6.5E+04	-	-	3.3E+02	6.5E+04	
2-Methyl-4,6-Dinitrophenol	0	-	-	1.3E+01	7.65E+02	-	-	6.2E+02	3.6E+04	-	-	1.3E+00	7.7E+01	-	-	6.2E+01	3.6E+03	-	-	6.2E+01	3.6E+03	
2,4-Dinitrotoluene <sup>c</sup>	0	-	-	1.1E+00	9.1E+01	-	-	6.3E+01	5.2E+03	-	-	1.1E-01	9.1E+00	-	-	6.3E+00	5.2E+02	-	-	6.3E+00	5.2E+02	
Dioxin (2,3,7,8-tetrachlorobiphenzo-p-dioxin) (ppq)	0	-	-	1.2E-06	-	-	-	1.2E-06	-	-	-	1.2E-07	-	-	-	1.2E-07	-	-	-	1.2E-07	-	
1,2-Diphenylhydrazine <sup>c</sup>	0	-	-	4.0E-01	5.4E+00	-	-	2.3E+01	3.1E+01	-	-	4.0E-02	5.4E-01	-	-	2.3E+00	3.1E+01	-	-	2.3E+00	3.1E+01	
Alpha-Endosulfan	0	2.2E-01	5.6E-02	1.1E+02	2.4E+02	9.2E+00	2.3E+00	5.1E+03	1.1E+04	5.5E-02	1.4E-02	1.1E+01	2.4E+01	2.3E+00	5.9E-01	5.1E+02	2.3E+00	5.9E-01	5.1E+02	1.1E+03		
Beta-Endosulfan	0	2.2E-01	5.6E-02	1.1E+02	2.4E+02	9.2E+00	2.3E+00	5.1E+03	1.1E+04	5.5E-02	1.4E-02	1.1E+01	2.4E+01	2.3E+00	5.9E-01	5.1E+02	2.3E+00	5.9E-01	5.1E+02	1.1E+03		
Endosulfan Sulfate	0	8.6E-02	3.6E-02	7.6E-01	8.1E-01	3.6E+00	3.5E+00	3.8E+01	2.2E+02	9.0E-03	1.1E+01	2.4E+01	9.0E-01	3.8E-01	3.5E+00	3.8E-01	9.0E-01	3.8E-01	3.5E+00	3.8E+00		
Endrin	0	-	-	7.6E-01	8.1E-01	-	-	3.5E+01	3.8E+01	-	-	7.6E-02	8.1E-02	-	-	3.5E+00	3.8E+00	-	-	3.5E+00	3.8E+00	
Endrin Aldehyde	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations				
		Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	
(ug/l unless noted)																						
Ethylbenzene	0	-	-	3.1E+03	2.9E+04	-	-	1.4E+05	1.3E+06	-	-	3.1E+02	2.9E+03	-	-	1.4E+04	1.3E+05	-	-	1.4E+04	1.3E+05	
Fluoranthene	0	-	-	3.0E+02	3.7E+02	-	-	1.4E+04	1.7E+04	-	-	3.0E+01	3.7E+01	-	-	1.4E+03	1.7E+03	-	-	1.4E+03	1.7E+03	
Fluorene	0	-	-	1.3E+03	1.4E+04	-	-	6.0E+04	6.5E+05	-	-	1.3E+02	1.4E+03	-	-	6.0E+03	6.5E+04	-	-	6.0E+03	6.5E+04	
Foaming Agents	0	-	-	5.0E+02	-	-	-	2.3E+04	-	-	-	5.0E+01	-	-	-	2.3E+03	-	-	-	2.3E+03	-	
Guthion	0	-	1.0E+02	-	-	4.2E+01	-	-	-	2.5E+03	-	-	1.0E+01	-	-	-	1.0E+01	-	-	-	1.0E+01	-
H-heptachlor	c	0	5.2E+01	3.8E+03	2.1E+03	2.2E+01	1.6E+01	1.2E+01	1.3E+01	9.5E+04	2.1E+04	5.4E+00	4.0E+00	4.0E+02	1.2E+02	5.4E+00	4.0E+02	4.0E+02	1.2E+02	5.4E+00	4.0E+02	
H-heptachlor Epoxyde <sup>c</sup>	0	5.2E+01	3.8E+03	1.0E+03	1.1E+03	2.2E+01	1.6E+01	5.7E+02	6.3E+02	1.3E+01	9.5E+04	1.0E+04	1.1E+04	5.4E+00	4.0E+02	5.7E+03	6.3E+03	5.4E+00	4.0E+02	5.7E+03	6.3E+03	
H-hexachlorobenzene <sup>c</sup>	0	-	-	7.5E+03	7.7E+03	-	-	4.3E+01	4.4E+01	-	-	7.5E+04	7.7E+04	-	-	4.3E+02	4.4E+02	-	-	4.3E+02	4.4E+02	
H-hexachlorobutadiene <sup>c</sup>	0	-	-	4.4E+00	5.0E+02	-	-	2.5E+02	2.9E+04	-	-	4.4E+01	5.0E+01	-	-	2.5E+01	2.9E+03	-	-	2.5E+01	2.9E+03	
H-hexachlorocyclohexane	0	-	-	3.9E+02	1.3E+01	-	-	2.2E+00	7.4E+00	-	-	3.9E+03	1.3E+02	-	-	2.2E+01	7.4E+01	-	-	2.2E+01	7.4E+01	
Alpha-BHC <sup>c</sup>	0	-	-	6.0E+00	2.6E+01	-	-	1.4E+02	4.6E+02	-	-	8.0E+01	2.6E+00	-	-	8.0E+01	2.6E+00	-	-	8.0E+01	2.6E+00	
Beta-BHC <sup>c</sup>	0	-	-	1.4E+01	4.6E+01	-	-	1.1E+01	3.6E+01	2.4E+01	-	1.9E+02	6.3E+02	1.0E+01	-	1.1E+00	3.6E+00	1.0E+01	-	1.1E+00	3.6E+00	
Hexachlorocyclohexane	0	-	1.9E+01	6.3E+01	4.0E+01	-	1.1E+01	3.6E+01	-	-	5.0E+01	-	-	2.1E+01	-	-	-	2.1E+01	-	-	-	
Gamma-BHC <sup>c</sup> (Lindane)	0	9.6E+01	-	1.9E+01	6.3E+01	4.0E+01	-	1.1E+01	3.6E+01	2.4E+01	-	1.9E+02	6.3E+02	1.0E+01	-	1.1E+00	3.6E+00	1.0E+01	-	1.1E+00	3.6E+00	
Hexachlorocyclopentadiene	0	-	-	2.4E+02	1.7E+04	-	-	1.1E+04	7.9E+05	-	-	2.4E+01	1.7E+03	-	-	1.1E+03	7.9E+04	-	-	1.1E+03	7.9E+04	
Hexachloroethane <sup>c</sup>	0	-	-	1.9E+01	8.9E+01	-	-	1.1E+03	5.1E+03	-	-	1.9E+00	8.9E+00	-	-	1.1E+02	5.1E+02	-	-	1.1E+02	5.1E+02	
Hydrogen Sulfide	0	-	2.0E+00	-	-	8.4E+01	-	-	-	5.0E+01	-	-	2.1E+01	-	-	-	2.1E+01	-	-	-	2.1E+01	-
Indeno (1,2,3-cd) pyrene <sup>c</sup>	0	-	-	4.5E+02	4.9E+01	-	-	2.5E+00	2.8E+01	-	-	4.4E+03	4.9E+02	-	-	2.5E+01	2.8E+00	-	-	2.5E+01	2.8E+00	
Iron	0	-	-	3.0E+02	-	-	-	1.4E+04	-	-	-	3.0E+01	-	-	-	1.4E+03	-	-	-	1.4E+03	-	
Isophrone <sup>c</sup>	0	-	-	3.6E+02	2.6E+04	-	-	2.1E+04	1.5E+06	-	-	3.6E+01	2.6E+03	-	-	2.1E+03	1.5E+05	-	-	2.1E+03	1.5E+05	
Kepone	0	-	0.0E+00	-	-	0.0E+00	-	-	-	0.0E+00	-	-	0.0E+00	-	-	-	0.0E+00	-	-	-	0.0E+00	-
Lead	0	1.9E+02	2.1E+01	1.5E+01	-	-	7.9E+03	9.0E+02	7.0E+02	-	4.7E+01	5.4E+00	1.5E+00	-	2.0E+03	2.3E+02	7.0E+01	-	2.0E+03	2.3E+02		
Malathion	0	-	-	1.0E+01	-	-	-	4.2E+00	-	-	-	2.5E+02	-	-	-	1.0E+00	-	-	-	1.0E+00	-	
Manganese	0	-	-	5.0E+01	-	-	-	0.0E+00	-	-	-	5.0E+00	-	-	-	0.0E+00	-	-	-	0.0E+00	-	
Mercury	0	1.4E+00	7.7E+01	5.0E+02	5.1E+02	5.9E+01	3.2E+01	2.3E+00	2.4E+00	3.5E+01	1.9E+01	5.0E+03	5.1E+03	1.5E+01	8.1E+00	2.3E+01	1.5E+01	8.1E+00	2.3E+01	1.5E+01		
Methyl Bromide	0	-	-	4.8E+01	4.0E+03	-	-	2.2E+03	1.9E+05	-	-	4.8E+00	4.0E+02	-	-	2.0E+03	2.3E+02	7.0E+01	-	2.0E+03	2.3E+02	
Methoxychlor	0	3.0E+02	1.0E+02	-	-	-	-	1.3E+06	4.6E+03	-	-	7.5E+03	1.0E+01	-	-	3.1E+01	4.6E+02	-	-	3.1E+01	4.6E+02	
Mirex	0	-	0.0E+00	-	-	-	-	0.0E+00	-	-	-	0.0E+00	-	-	-	0.0E+00	-	-	-	0.0E+00	-	
Monochlorobenzene	0	-	-	6.8E+02	2.1E+04	-	-	3.2E+04	9.8E+06	-	-	6.8E+01	2.1E+03	-	-	3.2E+03	9.8E+04	-	-	3.2E+03	9.8E+04	
Nickel	0	2.5E+02	2.8E+01	6.1E+01	4.6E+03	1.0E+04	2.1E+03	2.8E+00	6.2E+00	6.1E+01	4.6E+02	2.6E+03	2.9E+02	2.1E+04	2.6E+03	2.9E+02	2.8E+03	2.1E+04	2.6E+03	2.8E+03		
Nitrate (as N)	0	-	-	1.0E+04	-	-	-	4.6E+05	-	-	-	1.0E+03	-	-	-	4.6E+04	-	-	-	4.6E+04	-	
Nitrobenzene	0	-	-	1.7E+01	1.9E+03	-	-	7.9E+02	8.8E+04	-	-	1.7E+00	1.9E+02	-	-	7.9E+01	8.8E+03	-	-	7.9E+01	8.8E+03	
N-Nitrosodimethylamine <sup>c</sup>	0	-	-	6.9E+03	8.1E+01	-	-	3.9E+01	4.6E+03	-	-	6.9E+04	8.1E+00	-	-	3.9E+02	4.6E+02	-	-	3.9E+02	4.6E+02	
N-Nitrosodiphenylamine <sup>c</sup>	0	-	-	5.0E+01	1.6E+02	-	-	2.9E+03	9.1E+03	-	-	5.0E+00	1.6E+01	-	-	2.9E+02	9.1E+02	-	-	2.9E+02	9.1E+02	
Parathion	0	6.5E+02	1.3E+02	-	-	2.7E+00	5.4E+01	-	-	1.6E+02	3.3E+03	-	-	6.8E+01	1.4E+01	-	-	6.8E+01	1.4E+01	-	-	
PCB-1016	0	-	1.4E+02	-	-	-	-	5.9E+01	-	-	-	3.5E+03	-	-	-	1.5E+01	-	-	-	1.5E+01	-	
PCB-1221	0	-	1.4E+02	-	-	-	-	5.9E+01	-	-	-	3.5E+03	-	-	-	1.5E+01	-	-	-	1.5E+01	-	
PCB-1232	0	-	1.4E+02	-	-	-	-	5.9E+01	-	-	-	3.5E+03	-	-	-	1.5E+01	-	-	-	1.5E+01	-	
PCB-1242	0	-	1.4E+02	-	-	-	-	5.9E+01	-	-	-	3.5E+03	-	-	-	1.5E+01	-	-	-	1.5E+01	-	
PCB-1248	0	-	1.4E+02	-	-	-	-	5.9E+01	-	-	-	3.5E+03	-	-	-	1.5E+01	-	-	-	1.5E+01	-	
PCB-1254	0	-	1.4E+02	-	-	-	-	5.9E+01	-	-	-	3.5E+03	-	-	-	1.5E+01	-	-	-	1.5E+01	-	
PCB-1260	0	-	1.4E+02	-	-	-	-	5.9E+01	-	-	-	3.5E+03	-	-	-	1.5E+01	-	-	-	1.5E+01	-	
PCB Total <sup>c</sup>	0	-	1.7E+03	1.7E+03	-	-	9.7E+02	9.7E+02	-	-	1.7E+04	1.7E+04	-	-	9.7E+03	9.7E+03	-	-	9.7E+03	9.7E+03		

Parameter	Background Conc.	Water Quality Criteria			Wasteload Allocations			Antidegradation Baseline			Antidegradation Allocations			Most Limiting Allocations		
		Acute	Chronic	HH (PWS)	Acute	Chronic	HH (PWS)	Acute	Chronic	HH (PWS)	Acute	Chronic	HH (PWS)	Acute	Chronic	HH (PWS)
Pentachlorophenol <sup>c</sup>	0	8.7E+00	6.7E+00	2.8E+00	8.2E+01	3.7E+02	2.8E+02	1.6E+02	4.7E+03	2.2E+00	1.7E+00	2.8E+01	9.1E+01	7.0E+01	9.1E+01	4.7E+02
Phenol	0	—	—	2.1E+04	4.6E+06	—	—	9.8E+05	2.1E+08	—	—	2.1E+03	4.6E+05	—	—	9.8E+04
Pyrene	0	—	—	9.6E+02	1.1E+04	—	—	4.5E+04	5.1E+05	—	—	9.6E+01	1.1E+03	—	—	4.5E+03
Radium-226 (pCi/l except Beta/Photon)	0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Gross Alpha Activity	0	—	—	1.5E+01	1.5E+01	—	—	7.0E+02	7.0E+02	—	—	1.5E+00	1.5E+00	—	—	7.0E+01
Beta and Photon Activity (mrem/yr)	0	—	—	4.0E+00	4.0E+00	—	—	1.9E+02	1.9E+02	—	—	4.0E+01	4.0E+01	—	—	1.9E+01
Sodium	0	—	—	8.0E+00	8.0E+00	—	—	3.7E+02	3.7E+02	—	—	8.0E+01	8.0E+01	—	—	3.7E+01
Sulfate	0	—	—	2.0E+04	2.0E+04	—	—	9.3E+05	9.3E+05	—	—	2.0E+03	2.0E+03	—	—	9.3E+04
Strontium-90	0	—	—	5.0E+00	1.1E+04	8.4E+02	2.1E+02	7.9E+03	5.1E+05	5.0E+00	1.3E+00	1.7E+01	1.1E+03	2.1E+02	7.9E+02	5.1E+04
Tritium	0	—	—	6.5E+00	—	—	—	2.7E+02	—	—	—	1.6E+00	—	—	—	—
Selenium	0	—	—	2.5E+05	—	—	—	—	—	—	—	6.8E+01	—	—	—	6.8E+01
Silver	0	—	—	1.7E+00	—	—	—	—	—	—	—	2.5E+04	—	—	—	—
Sulfide	0	—	—	8.0E+00	8.9E+01	—	—	9.7E+01	6.3E+03	—	—	1.7E+01	1.1E+01	—	—	9.7E+00
1,1,2,2-Tetrachloroethane <sup>c</sup>	0	—	—	—	—	—	—	—	—	—	—	8.0E+01	8.9E+00	—	—	4.6E+01
Tetrachloroethylene <sup>c</sup>	0	—	—	—	—	—	—	—	—	—	—	4.6E+02	5.1E+02	—	—	5.1E+02
Thallium	0	—	—	1.7E+00	6.3E+00	—	—	7.9E+01	2.9E+02	—	—	1.7E+01	6.3E+01	—	—	7.9E+00
Toluene	0	—	—	6.8E+03	2.0E+05	—	—	3.2E+05	9.3E+06	—	—	6.8E+02	2.0E+04	—	—	3.2E+04
Total dissolved solids	0	—	—	5.0E+05	—	—	—	2.3E+07	—	—	—	5.0E+04	—	—	—	2.3E+06
Toxaphene <sup>c</sup>	0	7.3E-01	2.0E+04	7.3E-03	7.5E-03	3.1E+01	8.4E+03	4.2E+01	4.3E+01	1.8E+01	5.0E+05	7.3E-04	7.6E+00	2.1E-03	7.6E+00	2.1E-03
Tributyltin	0	4.6E-01	6.3E-02	—	—	1.9E+01	2.6E+00	—	—	1.2E+01	1.6E+02	—	—	4.6E+00	6.6E-01	—
1,2,4-Trichlorobenzene	0	—	—	2.6E+02	9.4E+02	—	—	1.2E+04	4.4E+04	—	—	2.6E+01	9.4E+01	—	—	4.4E+03
1,1,2-Trichloroethane <sup>c</sup>	0	—	—	6.0E+00	4.2E+02	—	—	3.4E+02	2.4E+04	—	—	6.0E+01	4.2E+01	—	—	3.4E+03
Trichloroethylene <sup>c</sup>	0	—	—	2.7E+01	8.1E+02	—	—	1.5E+03	4.6E+04	—	—	2.7E+00	8.1E+01	—	—	1.6E+02
2,4,5-Trichlorophenol <sup>c</sup>	0	—	—	2.1E+01	6.5E+01	—	—	1.2E+03	3.7E+03	—	—	2.1E+00	6.5E+00	—	—	1.2E+02
2-(2,4,5-Trichlorophenoxy)propanoic acid (Silvex)	0	—	—	5.0E+01	—	—	—	2.3E+03	—	—	—	5.0E+00	—	—	—	2.3E+02
Vinyl Chloride <sup>c</sup>	0	—	—	2.3E+01	6.1E+01	—	—	1.3E+01	3.5E+03	—	—	2.3E+02	6.1E+00	—	—	1.3E+00
Zinc	0	1.6E+02	1.6E+02	9.1E+03	6.9E+04	6.7E+03	6.7E+03	4.2E+05	3.2E+06	4.0E+01	4.0E+01	9.1E+02	6.9E+03	1.7E+03	4.2E+04	3.2E+05

Notes:

1. All concentrations expressed as micrograms/filter (ug/l), unless noted otherwise

2. Discharge flow is highest monthly average or Form 2C maximum for Industries and design flow for Municipal

3. Metals measured as Dissolved, unless specified otherwise

4. "C" indicates a carcinogenic parameter

5. Regular WLAs are mass balances (minus background concentration) using the % of stream flow entered above under Mixing Information.

Antidegradation WLAs are based upon a complete mix.

6. Antideg. Baseline = (0.25(WQC - background conc.) + background conc.) for acute and chronic

= (0.1(WQC - background conc.) + background conc.) for human health

7. WLAs established at the following stream flows: 1Q10 for Acute, 3Q10 for Chronic Ammonia, 7Q10 for Other Chronic, 3QG5 for Non-carcinogens, Harmonic Mean for Carcinogens, and Annual Average for Dioxin. Mixing ratios may be substituted for stream flows where appropriate.

Metal	Target Value (SSTV)
Antimony	6.5E-01
Arsenic	4.6E-01
Barium	9.3E-03
Cadmium	9.5E-00
Chromium III	6.3E+02
Chromium VI	6.7E-01
Copper	7.7E-01
Iron	1.4E+03
Lead	7.0E+01
Manganese	2.3E+02
Mercury	2.3E-01
Nickel	1.7E-02
Selenium	3.1E+01
Silver	2.7E-01
Zinc	6.7E-02

Note: do not use QL's lower than the minimum QL's provided in agency guidance

## 0.007 MGD DISCHARGE FLOW - STREAM MIX PER "Mix.exe"

Discharge Flow Used for WQS-WLA Calculations (MGD)						0.007	Ammonia - Dry Season - Acute						
Stream Flows		Total Mix Flows				90th Percentile pH (SU) (7.204 - pH) (pH - 7.204)	8.160 -0.956 0.956	Ammonia - Dry Season - Chronic					
Dry Season	Allocated to Mix (MGD)	Wet Season	Stream + Discharge (MGD)	Dry Season	Wet Season	Trout Present Criterion (mg N/L)	4.131	90th Percentile Temp. (deg C)	25.000				
1Q10	0.270	0.320	0.277	N/A	0.327	Trout Absent Criterion (mg N/L)	6.185	90th Percentile pH (SU)	8.162				
7Q10	0.270	N/A	0.280	0.340	0.287	Trout Present?	"	90th Percentile pH (SU)	1.450				
30Q10	0.280	0.300	N/A	N/A	0.307	Effective Criterion (mg N/L)	6.185	MIN	25.000				
30Q5	0.300	N/A	N/A	N/A	0.377			MAX	-0.474				
Harm. Mean	0.370	N/A	N/A	N/A	0.007			(7.688 - pH)	(pH - 7.688)				
Annual Avg.	0.000	N/A	N/A	N/A	N/A								
Stream/Discharge Mix Values						Ammonia - Wet Season - Acute							
Dry Season				Wet Season		90th Percentile pH (SU) (7.204 - pH) (pH - 7.204)	8.166 -0.962 0.962	Ammonia - Wet Season - Chronic					
1Q10 90th% Temp. Mix (deg C)		25.000	12.165			Trout Present Criterion (mg N/L)	4.085	90th Percentile Temp. (deg C)	12.149				
30Q10 90th% Temp. Mix (deg C)		25.000	12.149			Trout Absent Criterion (mg N/L)	6.116	90th Percentile pH (SU)	8.168				
1Q10 90th% pH Mix (SU)		8.160	8.166			Trout Present?	"	MIN	2.850				
30Q10 90th% pH Mix (SU)		8.162	8.168			Effective Criterion (mg N/L)	6.116	MAX	12.149				
1Q10 10th% pH Mix (SU)		7.000	N/A					(7.688 - pH)	(pH - 7.688)				
7Q10 10th% pH Mix (SU)		7.000	N/A										
Calculated Formula Inputs		144.0	144.0					Early LS Present Criterion (mg N/L)	0.970				
Calculated Formula Inputs		144.0	144.0					Early LS Absent Criterion (mg N/L)	0.970				
1Q10 Hardness (mg/L as CaCO3)		144.0	144.0					Early Life Stages Present?	y				
7Q10 Hardness (mg/L as CaCO3)		144.0	144.0					Effective Criterion (mg N/L)	0.970				

## 0.007 MGD DISCHARGE FLOW - COMPLETE STREAM MIX

Discharge Flow Used for WQS-WLA Calculations (MGD)						0.007	Ammonia - Dry Season - Acute						
100% Stream Flows		Total Mix Flows				90th Percentile pH (SU) (7.204 - pH) (pH - 7.204)	8.160 -0.956 0.956	Ammonia - Dry Season - Chronic					
Dry Season	Allocated to Mix (MGD)	Wet Season	Stream + Discharge (MGD)	Dry Season	Wet Season	Trout Present Criterion (mg N/L)	4.131	90th Percentile Temp. (deg C)	25.000				
1Q10	0.270	0.320	0.277	N/A	0.327	Trout Absent Criterion (mg N/L)	6.185	90th Percentile pH (SU)	8.162				
7Q10	0.270	N/A	0.280	0.340	0.277	Trout Present?	"	90th Percentile pH (SU)	1.450				
30Q10	0.280	0.300	N/A	N/A	0.307	Effective Criterion (mg N/L)	6.185	MIN	25.000				
30Q5	0.300	N/A	N/A	N/A	0.377			MAX	-0.474				
Harm. Mean	0.370	N/A	N/A	N/A	0.007			(7.688 - pH)	(pH - 7.688)				
Annual Avg.	0.000	N/A	N/A	N/A	N/A								
Stream/Discharge Mix Values						Ammonia - Wet Season - Acute							
Dry Season				Wet Season		90th Percentile pH (SU) (7.204 - pH) (pH - 7.204)	8.166 -0.962 0.962	Ammonia - Wet Season - Chronic					
1Q10 90th% Temp. Mix (deg C)		25.000	12.165			Trout Present Criterion (mg N/L)	4.085	90th Percentile Temp. (deg C)	12.149				
30Q10 90th% Temp. Mix (deg C)		25.000	12.149			Trout Absent Criterion (mg N/L)	6.116	90th Percentile pH (SU)	8.168				
1Q10 90th% pH Mix (SU)		8.160	8.166			Trout Present?	"	MIN	2.850				
30Q10 90th% pH Mix (SU)		8.162	8.168			Effective Criterion (mg N/L)	6.116	MAX	12.149				
1Q10 10th% pH Mix (SU)		7.000	N/A					(7.688 - pH)	(pH - 7.688)				
7Q10 10th% pH Mix (SU)		7.000	N/A										
Calculated Formula Inputs		144.000	144.000					Early LS Present Criterion (mg N/L)	0.970				
Calculated Formula Inputs		144.000	144.000					Early LS Absent Criterion (mg N/L)	0.970				
1Q10 Hardness (mg/L as CaCO3)		144.000	144.000					Early Life Stages Present?	y				
7Q10 Hardness (mg/L as CaCO3)		144.000	144.000					Effective Criterion (mg N/L)	0.970				

3/10/2008 2:01:28 PM

Facility = Woodhaven Nursing Home WWTP  
Chemical = ammonia as N (mg/L) (0.0066 mg/L)  
Chronic averaging period = 30  
WLAa = 65  
WLAc = 11  
Q.L. = 0.2  
# samples/mo. = 1  
# samples/wk. = 1

Summary of Statistics:

# observations = 1  
Expected Value = 9  
Variance = 29.16  
C.V. = 0.6  
97th percentile daily values = 21.9007  
97th percentile 4 day average = 14.9741  
97th percentile 30 day average= 10.8544  
# < Q.L. = 0  
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

1/29/2008 1:42:24 PM

Facility = Woodhaven Nursing Home WWTP  
Chemical = TRC (ug/L) 0.0066 MGD  
Chronic averaging period = 4  
WLAa = 200  
WLAc = 120  
Q.L. = 100  
# samples/mo. = 30  
# samples/wk. = 8

Summary of Statistics:

# observations = 1  
Expected Value = 1000  
Variance = 360000  
C.V. = 0.6  
97th percentile daily values = 2433.41  
97th percentile 4 day average = 1663.79  
97th percentile 30 day average= 1206.05  
# < Q.L. = 0  
Model used = BPJ Assumptions, type 2 data

A limit is needed based on Chronic Toxicity  
Maximum Daily Limit = 175.508974086388  
Average Weekly limit = 104.691995664012  
Average Monthly Limit = 86.9859620059178

The data are:

1000

# **0.025 MGD Facility**

# FRESHWATER WATER QUALITY CRITERIA / WASTELOAD ALLOCATION ANALYSIS

Facility Name: Woodhaven Nursing Home WWTP  
 Receiving Stream: South Fork Goose Creek, UT

Permit No.: VA0074840

Version: OWP Guidance Memo 00-2011 (8/24/00)

Stream Information		Stream Flows		Mixing Information				Effluent Information			
		Q10 (Annual) =	0.27 MGD	Annual - Q10 Mix =	100 %	Mean Hardness (as CaCO <sub>3</sub> ) =	144 mg/L	90% Temp (Annual) =	100 %	90% Temp (Wet season) =	25 deg C
Mean Hardness (as CaCO <sub>3</sub> ) =	144 mg/L	7Q10 (Annual) =	0.27 MGD	- 7Q10 Mix =	100 %	90% Temp (Wet season) =	25 deg C	30Q10 (Annual) =	0.28 MGD	- 30Q10 Mix =	7.5 SU
90% Temperature (Annual) =	25 deg C	30Q10 (Annual) =	0.32 MGD	Wet Season - 1Q10 Mix =	100 %	90% Maximum pH =	7 SU	1Q10 (Wet season) =	0.34 MGD	- 30Q10 Mix =	10% Maximum pH =
90% Temperature (Wet season) =	11.9 deg C	30Q10 (Wet season) =	0.3 MGD	- 30Q10 Mix =	100 %	10% Maximum pH =	7 SU	30Q5 =	0.3 MGD	Discharge Flow =	0.025 MGD
90% Maximum pH =	8.2 SU	30Q5 =	0.31 MGD					Tier Designation (1 or 2) =	2		
10% Maximum pH =	7 SU	Harmonic Mean =	0.31 MGD					Public Water Supply (PWS) Y/N? =	y		
Tier Designation (1 or 2) =	2	Annual Average =	MGD					Trout Present Y/N? =	n		
Early Life Stages Present Y/N? =	y										

Parameter (ug/l unless noted)	Background Conc.	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
		Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Acenaphthene	0	--	--	1.2E+03	2.7E+03	--	--	1.6E+04	3.5E+04	--	--	1.2E+02	2.7E+02	--	--	1.6E+03	3.5E+03	--	--	1.6E+03	3.5E+03
Acrolein	0	--	--	3.2E+02	7.8E+02	--	--	4.2E+03	1.0E+04	--	--	3.2E+01	7.8E+01	--	--	4.2E+02	1.0E+03	--	--	4.2E+02	1.0E+03
Acrylonitrile <sup>c</sup>	0	--	--	5.9E-01	6.6E+00	--	--	9.3E-00	1.0E+02	--	--	5.9E-02	6.6E-01	--	--	9.3E-01	1.0E+01	--	--	9.3E-01	1.0E+01
Aldrin <sup>c</sup>	0	3.0E+00	--	1.3E-03	3.5E+01	--	--	2.1E+02	2.2E+02	7.5E-01	--	1.3E-04	1.4E-04	8.9E+00	--	8.9E+00	--	--	--	2.1E+03	2.2E+03
Ammonia-N (mg/l) (Yearly)	0	7.32E+00	1.11E+00	--	--	8.6E+01	1.3E+01	--	--	1.83E+00	2.76E-01	--	--	2.2E+01	3.4E+00	--	--	2.2E+01	3.4E+00	--	--
Ammonia-N (mg/l) (High Flow)	0	7.09E+00	2.11E+00	--	--	9.8E+01	3.1E+01	--	--	1.77E+00	5.29E-01	--	--	2.4E+01	7.7E+00	--	--	2.4E+01	7.7E+00	--	--
Anthracene	0	--	--	9.6E+03	1.1E+05	--	--	1.2E+05	1.4E+06	--	--	9.6E+02	1.1E+04	--	--	1.2E+04	1.4E+05	--	--	1.2E+04	1.4E+05
Antimony	0	--	--	1.4E+01	4.3E+03	--	--	1.8E+02	5.6E+04	--	--	1.4E+00	4.3E+02	--	--	1.8E+01	5.6E+03	--	--	1.8E+01	5.6E+03
Arsenic	0	3.4E+02	1.5E+02	1.0E+01	--	4.0E+03	1.8E+03	1.3E+02	--	8.5E+01	3.8E+01	1.0E+00	--	1.0E+03	4.4E+02	1.3E+01	--	1.0E+03	4.4E+02	1.3E+01	--
Barium	0	--	--	2.0E+03	--	--	--	2.6E+04	--	--	--	2.0E+02	--	--	--	2.6E+03	--	--	--	2.6E+03	--
Benzene <sup>c</sup>	0	--	--	1.2E+01	7.1E+02	--	--	1.9E+02	1.1E+04	--	--	1.2E+00	7.1E+01	--	--	1.9E+01	1.1E+03	--	--	1.9E+01	1.1E+03
Benzidine <sup>c</sup>	0	--	--	1.2E-03	5.4E-03	--	--	1.9E-02	8.5E-02	--	--	1.2E-04	5.4E-04	--	--	1.9E-03	8.5E-03	--	--	1.9E-03	8.5E-03
Benzo (a) anthracene <sup>c</sup>	0	--	--	4.4E-02	4.9E-01	--	--	7.0E-01	7.7E+00	--	--	4.4E-03	4.9E-02	--	--	7.0E-02	7.7E-01	--	--	7.0E-02	7.7E-01
Benzo (b) fluoranthene <sup>c</sup>	0	--	--	4.4E-02	4.9E-01	--	--	7.0E-01	7.7E+00	--	--	4.4E-03	4.9E-02	--	--	7.0E-02	7.7E-01	--	--	7.0E-02	7.7E-01
Benzo (k) fluoranthene <sup>c</sup>	0	--	--	4.4E-02	4.9E-01	--	--	7.0E-01	7.7E+00	--	--	4.4E-03	4.9E-02	--	--	7.0E-02	7.7E-01	--	--	7.0E-02	7.7E-01
Benzo (a) pyrene <sup>c</sup>	0	--	--	3.0E+03	5.2E+03	--	--	3.9E+04	6.8E+04	--	--	3.0E+02	5.2E+02	--	--	3.9E+03	6.8E+03	--	--	3.9E+03	6.8E+03
Bis2-Chloroethyl Ether	0	--	--	1.4E+03	1.7E+05	--	--	1.8E+04	2.2E+06	--	--	1.4E+02	1.7E+04	--	--	1.8E+03	2.2E+05	--	--	1.8E+03	2.2E+05
Bis2-Chloroisopropyl Ether	0	--	--	4.4E+01	3.6E+03	--	--	7.0E+02	5.7E+04	--	--	4.4E+00	3.6E+02	--	--	7.0E+01	5.7E+03	--	--	7.0E+01	5.7E+03
Bromform	0	--	--	1.4E+01	4.4E+01	--	--	1.0E+02	1.1E+00	--	--	1.0E+01	4.9E-02	--	--	1.0E+00	5.7E+03	--	--	1.0E+00	5.7E+03
Butylbenzylphthalate	0	--	--	5.9E+00	1.5E+00	--	--	7.0E+01	1.8E+01	6.5E+01	--	1.5E+00	3.8E+01	5.0E-01	--	1.7E+01	4.5E+00	6.5E+00	--	1.7E+01	4.5E+00
Cadmium	0	--	--	2.5E+00	4.4E+01	--	--	4.0E+01	7.0E+02	--	--	2.5E-01	4.4E+00	--	--	4.0E+00	7.0E+01	--	--	4.0E+00	7.0E+01
Carbon Tetrachloride <sup>c</sup>	0	--	--	2.4E+00	4.3E+03	2.1E-02	2.2E-02	2.8E+01	5.1E-02	3.3E-01	3.5E-01	6.0E-01	1.1E-03	2.1E-03	2.2E-03	7.1E+00	1.3E-02	3.3E+05	3.5E-02	1.3E-02	3.3E+05
Chlordane <sup>c</sup>	0	--	--	8.6E+05	2.3E+05	--	--	1.0E+07	2.7E+06	3.3E+06	--	2.2E+05	5.8E+04	2.5E+04	--	2.5E+06	6.8E+05	--	--	2.5E+06	6.8E+05
Chloride	0	1.9E+01	1.1E+01	--	--	2.2E+02	1.3E+02	--	--	4.8E+00	2.8E+00	--	--	5.6E+01	3.2E+01	--	--	5.6E+01	3.2E+01	--	--
TRC	0	--	--	6.8E+02	2.1E+04	--	--	8.8E+03	2.7E+05	--	--	6.8E+01	2.1E+03	--	--	8.8E+02	2.7E+04	--	--	8.8E+02	2.7E+04

Parameter (ug/l unless noted)	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
		Canc.	Acute	Chronic	HH (PWs)	Acute	Chronic	HH (PWs)	HH	Acute	Chronic	HH (PWs)	HH	Acute	Chronic	HH (PWs)	HH	Acute	Chronic	HH (PWs)	HH
Chlorodibromomethane <sup>c</sup>	0	-	-	4.1E+00	3.4E+02	-	-	6.5E+01	5.4E+03	-	-	4.1E-01	3.4E+01	-	-	6.5E+00	5.4E+02	-	-	6.5E+00	5.4E+02
Chloroform <sup>c</sup>	0	-	-	3.5E+02	2.9E+04	-	-	5.5E+03	4.6E+05	-	-	3.5E+01	2.9E+03	-	-	5.5E+02	4.6E+04	-	-	5.5E+02	4.6E+04
2-Chloronaphthalene	0	-	-	1.7E+03	4.3E+03	-	-	2.2E+04	5.6E+04	-	-	1.7E+02	4.3E+02	-	-	2.2E+03	5.6E+03	-	-	2.2E+03	5.6E+03
2-Chlorophenol	0	-	-	1.2E+02	4.0E+02	-	-	1.6E+03	5.2E+03	-	-	1.2E+01	4.0E+01	-	-	1.6E+02	5.2E+02	-	-	1.6E+02	5.2E+02
Chlorpyrifos	0	8.3E-02	4.1E-02	1.0E+02	-	-	9.8E-01	4.8E+01	-	-	2.1E-02	1.0E+02	-	-	2.4E-01	1.2E+01	-	-	2.4E-01	1.2E+01	
Chromium III	0	7.7E+02	1.0E+02	-	-	-	9.1E+03	1.2E+03	-	-	1.9E+02	2.5E+01	-	-	2.3E+03	2.9E+02	-	-	2.3E+03	2.9E+02	
Chromium VI	0	1.6E+01	1.1E+01	-	-	1.9E+02	1.3E+02	-	-	4.0E+00	2.8E+00	-	-	4.7E+01	3.2E+01	-	-	4.7E+01	3.2E+01		
Chromium, Total	0	-	-	1.0E+02	-	-	1.3E+03	-	-	-	1.0E+01	-	-	-	1.3E+02	-	-	-	1.3E+02	-	
Chrysene <sup>c</sup>	0	-	-	4.4E-02	4.9E-01	-	-	7.0E+01	7.7E+00	-	-	4.4E-03	4.9E-02	-	-	7.0E+02	7.7E+01	-	-	7.0E+02	7.7E+01
Copper	0	1.9E+01	1.2E+01	-	-	2.2E+02	1.4E+02	1.7E+04	-	4.7E+00	3.1E+00	1.3E+02	-	5.6E+01	1.7E+03	-	-	5.6E+01	1.7E+03		
Cyanide	0	2.2E+01	5.2E+00	7.0E+02	2.2E+05	6.1E+02	9.1E+01	2.8E+00	5.5E+00	1.3E+00	7.0E+01	2.2E+04	6.5E+01	1.5E+01	2.8E+05	9.1E+01	1.5E+01	9.1E+02	2.8E+05		
DDD <sup>c</sup>	0	-	-	8.3E-03	8.4E-03	-	-	1.3E-01	-	8.3E-04	8.4E-04	-	-	1.3E-02	1.3E-02	-	-	1.3E-02	1.3E-02		
DDO <sup>c</sup>	0	-	-	5.9E-03	5.9E-03	-	-	9.3E-02	9.3E-02	-	-	5.9E-04	5.9E-04	-	-	9.3E-03	9.3E-03	-	-	9.3E-03	9.3E-03
DDT <sup>c</sup>	0	1.1E+00	1.0E-03	5.9E-03	1.3E+01	1.3E+01	9.3E-02	9.3E-02	2.8E+01	2.5E+04	5.9E-04	3.2E+00	3.0E-03	9.3E-03	3.2E+00	3.0E-03	9.3E-03	3.2E+00	3.0E-03	9.3E-03	
Demeton	0	-	-	1.0E-01	-	-	1.2E+00	-	-	-	2.5E+02	-	-	-	3.0E-01	-	-	-	3.0E-01	-	
Dibenz(a,h)anthracene <sup>c</sup>	0	-	-	4.4E-02	4.9E-01	-	-	7.0E+01	7.7E+00	-	-	4.4E-03	4.9E-02	-	-	7.0E+02	7.7E+01	-	-	7.0E+02	7.7E+01
Diethyl phthalate	0	-	-	2.7E+03	1.2E+04	-	-	3.5E+04	1.6E+05	-	-	2.7E+02	1.2E+03	-	-	3.5E+03	1.6E+04	-	-	3.5E+03	1.6E+04
(Dichloromethane (Methylene Chloride)) <sup>c</sup>	0	-	-	4.7E+01	1.6E+04	-	-	7.4E+02	2.5E+05	-	-	4.7E+00	1.6E+03	-	-	7.4E+01	2.5E+04	-	-	7.4E+01	2.5E+04
1,2-Dichlorobenzene	0	-	-	2.7E+03	1.7E+04	-	-	3.5E+04	2.2E+05	-	-	2.7E+02	1.7E+03	-	-	3.5E+03	2.2E+04	-	-	3.5E+03	2.2E+04
1,3-Dichlorobenzene	0	-	-	4.0E+02	2.6E+03	-	-	5.2E+03	3.4E+04	-	-	4.0E+01	2.6E+02	-	-	5.2E+02	3.4E+03	-	-	5.2E+02	3.4E+03
1,4-Dichlorobenzene	0	-	-	4.0E+02	2.6E+03	-	-	5.2E+03	3.4E+04	-	-	4.0E+01	2.6E+02	-	-	5.2E+02	3.4E+03	-	-	5.2E+02	3.4E+03
3,3-Dichlorobenzidine <sup>c</sup>	0	-	-	4.0E+01	7.7E+01	-	-	6.3E+00	1.2E+01	-	-	4.0E+02	7.7E+02	-	-	6.3E+01	1.2E+00	-	-	6.3E+01	1.2E+00
Dichlorobromomethane <sup>c</sup>	0	-	-	5.6E+00	4.6E+02	-	-	8.8E+01	7.3E+03	-	-	5.6E+01	4.6E+01	-	-	8.8E+00	7.3E+02	-	-	8.8E+00	7.3E+02
1,2-Dichloroethane <sup>c</sup>	0	-	-	3.8E+00	9.9E+02	-	-	6.0E+01	1.6E+04	-	-	3.8E+01	9.9E+01	-	-	6.0E+00	1.6E+03	-	-	6.0E+00	1.6E+03
1,1-Dichloroethylene	0	-	-	3.1E+02	1.7E+04	-	-	4.0E+03	2.2E+05	-	-	3.1E+01	1.7E+03	-	-	4.0E+02	2.2E+04	-	-	4.0E+02	2.2E+04
1,2-trans-dichloroethylene	0	-	-	7.0E+02	1.4E+05	-	-	9.1E+03	1.8E+06	-	-	7.0E+01	1.4E+04	-	-	9.1E+02	1.8E+05	-	-	9.1E+02	1.8E+05
2,4-Dichlorophenol	0	-	-	9.3E+01	7.9E+02	-	-	1.2E+03	1.0E+04	-	-	9.3E+00	7.9E+01	-	-	1.2E+02	1.0E+03	-	-	1.2E+02	1.0E+03
2,4-Dichlorophenoxy acetic acid (2,4-D)	0	-	-	1.0E+02	-	-	1.3E+03	-	-	-	1.0E+01	-	-	-	1.3E+02	-	-	-	1.3E+02	-	
1,2-Dichloropropane	0	-	-	5.2E+00	3.9E+02	-	-	8.2E+01	6.2E+03	-	-	5.2E+01	3.9E+01	-	-	8.2E+00	6.2E+02	-	-	8.2E+00	6.2E+02
1,3-Dichloropropene	0	-	-	1.0E+01	1.7E+03	-	-	1.3E+02	2.2E+04	-	-	1.0E+00	1.7E+02	-	-	1.3E+01	2.2E+03	-	-	1.3E+01	2.2E+03
Dieldrin <sup>c</sup>	0	2.4E-01	5.6E-02	1.4E-03	2.8E+00	6.6E-01	2.2E-02	6.0E-02	1.4E-02	1.2E-02	7.1E-01	1.7E-01	2.2E-03	7.1E-01	1.7E-01	2.2E-03	7.1E-01	1.7E-01	2.2E-03	7.1E-01	
Dieldrin Phthalate	0	-	-	2.3E+04	1.2E+05	-	-	3.0E+05	1.6E+06	-	-	2.3E+03	1.2E+04	-	-	3.0E+04	1.6E+05	-	-	3.0E+04	1.6E+05
Di-Ethyl Phthalate	0	-	-	1.8E+01	5.9E+01	-	-	2.8E+02	9.3E+02	-	-	1.8E+00	5.9E+00	-	-	2.8E+01	9.3E+01	-	-	2.8E+01	9.3E+01
Di-2-Ethylhexyl Phthalate <sup>c</sup>	0	-	-	5.4E+02	2.3E+03	-	-	7.0E+03	3.0E+04	-	-	5.4E+01	2.3E+02	-	-	7.0E+02	3.0E+03	-	-	7.0E+02	3.0E+03
2,4-Dimethylphenol	0	-	-	3.1E+05	2.9E+06	-	-	4.1E+06	3.8E+07	-	-	3.1E+04	2.9E+05	-	-	4.1E+05	3.8E+06	-	-	4.1E+05	3.8E+06
Dimethyl Phthalate	0	-	-	2.7E+03	1.2E+04	-	-	3.5E+04	1.6E+05	-	-	2.7E+02	1.2E+03	-	-	3.5E+03	1.6E+04	-	-	3.5E+03	1.6E+04
Di-n-Butyl Phthalate	0	-	-	7.0E+01	1.4E+04	-	-	9.1E+02	1.8E+05	-	-	7.0E+00	1.4E+03	-	-	9.1E+01	1.8E+04	-	-	9.1E+01	1.8E+04
2,4-Dinitrophenol	0	-	-	1.3E+01	7.65E+02	-	-	1.7E+02	9.9E+03	-	-	1.3E+00	7.7E+01	-	-	1.7E+01	9.9E+02	-	-	1.7E+01	9.9E+02
2-Methyl-4,6-Dinitrophenol	0	-	-	1.1E+00	9.1E+01	-	-	1.4E+01	1.4E+03	-	-	1.1E+01	9.1E+00	-	-	1.7E+00	1.4E+02	-	-	1.7E+00	1.4E+02
2,4-Dinitrotoluene <sup>c</sup>	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Dioxin (2,3,7,8-tetrachlorobiphenzo-p-dioxin) (ppq)	0	-	-	1.2E-06	-	-	1.2E-06	-	-	-	1.2E-07	-	-	-	1.2E-07	-	-	-	1.2E-07	-	
1,2-Diphenylhydrazine <sup>c</sup>	0	-	-	4.0E-01	-	-	6.3E+00	8.5E+01	-	-	4.0E-02	5.4E-01	-	-	6.3E+01	8.5E+00	-	-	6.3E+01	8.5E+00	
Alpha-Endosulfan	0	2.2E-01	5.6E-02	1.1E+02	2.4E+02	2.6E+00	6.6E-01	1.4E+03	3.1E+03	-	-	6.5E+01	1.7E-01	-	-	6.5E+01	1.7E-01	-	-	6.5E+01	1.7E-01
Beta-Endosulfan	0	2.2E-01	5.6E-02	1.1E+02	2.4E+02	2.6E+00	6.6E-01	1.4E+03	3.1E+03	-	-	6.5E+01	1.7E-01	-	-	6.5E+01	1.7E-01	-	-	6.5E+01	1.7E-01
Endosulfan Sulfate	0	8.6E-02	3.6E-02	7.6E-01	8.1E-01	1.0E+00	4.2E+01	9.9E+00	1.1E+01	2.2E+02	9.0E-03	7.6E-02	8.1E-02	-	-	2.5E+01	1.1E+01	-	-	2.5E+01	1.1E+01
Endrin	0	-	-	7.6E-01	8.1E-01	-	-	9.9E+00	1.1E+01	-	-	7.6E-02	8.1E-02	-	-	9.9E+01	1.1E+00	-	-	9.9E+01	1.1E+00
Endrin Aldehyde	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
		Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
(ug/l unless noted)	Conc.																				
Ethylbenzene	0	-	-	3.1E+03	2.9E+04	-	-	4.0E+04	3.8E+05	-	-	3.1E+02	2.9E+03	-	-	4.0E+03	3.8E+04	-	-	4.0E+03	3.8E+04
Fluoranthene	0	-	-	3.0E+02	3.7E+02	-	-	3.9E+03	4.8E+03	-	-	3.0E+01	3.7E+01	-	-	3.9E+02	4.8E+02	-	-	3.9E+02	4.8E+02
Fluorene	0	-	-	1.3E+03	1.4E+04	-	-	1.7E+04	1.8E+05	-	-	1.3E+02	1.4E+03	-	-	1.7E+03	1.8E+04	-	-	1.7E+03	1.8E+04
Flaming Agents	0	-	-	5.0E+02	-	-	-	6.5E+03	-	-	-	5.0E+01	-	-	-	6.5E+02	-	-	-	6.5E+02	-
Guthion	0	-	1.0E-02	-	-	1.2E-01	-	-	-	2.5E-03	-	-	-	3.0E-02	-	-	-	3.0E-02	-	-	-
Haptachlor c	0	5.2E-04	3.8E-03	2.1E-03	2.1E-03	6.1E+00	4.5E-02	3.3E-02	3.3E-02	1.3E-01	9.5E-04	2.1E-04	1.5E+00	1.1E-02	3.3E-03	1.5E+00	1.1E-02	3.3E-03	1.5E+00	1.1E-02	3.3E-03
Haptachlor Epoxide c	0	5.2E-01	3.8E-03	1.0E-03	1.1E-03	6.1E+00	4.5E-02	1.6E-02	1.7E-02	1.3E-01	9.5E-04	1.0E-04	1.5E+00	1.1E-02	1.7E-03	1.5E+00	1.1E-02	1.6E-03	1.5E+00	1.1E-02	1.7E-03
Hexachlorobenzene c	0	-	-	7.5E-03	7.7E-03	-	-	1.2E-01	1.2E-01	-	-	7.5E-04	7.7E-04	-	-	1.2E-02	1.2E-02	-	-	1.2E-02	1.2E-02
Hexachlorobutadiene c	0	-	-	4.4E-00	6.0E+02	-	-	7.0E+01	7.9E+03	-	-	4.4E-01	5.0E+01	-	-	7.0E+00	7.9E+02	-	-	7.0E+00	7.9E+02
Hexachlorobutene	0	-	-	3.9E-02	1.3E-01	-	-	6.2E-01	2.1E+00	-	-	3.9E-03	1.3E-02	-	-	6.2E-02	2.1E-01	-	-	6.2E-02	2.1E-01
Alpha-BHC c	0	-	-	1.4E-01	4.6E-01	-	-	2.2E+00	7.3E+00	-	-	1.4E-02	4.6E-02	-	-	2.2E-01	7.3E-01	-	-	2.2E-01	7.3E-01
Beta-BHC c	0	-	-	9.5E-01	6.3E-01	1.1E-01	-	3.0E+00	1.0E+01	2.4E-01	-	1.9E-02	6.3E-02	2.8E+00	-	3.0E-01	1.0E+00	2.8E+00	-	3.0E-01	1.0E+00
Hexachlorocyclohexane	0	-	-	2.4E-02	1.7E-04	-	-	3.1E+03	2.2E+05	-	-	2.4E-01	1.7E+03	-	-	3.1E+02	2.2E+04	-	-	3.1E+02	2.2E+04
Hexachlorobutadiene	0	-	-	1.9E-01	8.9E-01	-	-	3.0E+02	1.4E+03	-	-	1.9E+00	8.9E+00	-	-	3.0E+01	1.4E+02	-	-	3.0E+01	1.4E+02
Hexachlorobutene	0	-	-	2.0E+00	-	-	2.4E+01	-	-	5.0E-01	-	-	-	5.9E+00	-	-	-	5.9E+00	-	-	-
Hydrogen Sulfide	0	-	-	4.4E-02	4.9E-01	-	-	7.0E-01	7.7E+00	-	-	4.4E-03	4.9E-02	-	-	7.0E-02	7.7E-01	-	-	7.0E-02	7.7E-01
Indeno (1,2,3-cd) pyrene c	0	-	-	3.0E+02	-	-	-	3.9E+03	-	-	-	3.0E+01	...	-	-	3.9E+02	-	-	-	3.9E+02	-
Iron	0	-	-	3.6E+02	2.6E+04	-	-	5.7E+03	4.1E+05	-	-	3.6E+01	2.6E+03	-	-	5.7E+02	4.1E+04	-	-	5.7E+02	4.1E+04
Isophorone c	0	-	-	0.0E+00	-	-	0.0E+00	-	-	0.0E+00	-	-	-	0.0E+00	-	-	-	0.0E+00	-	-	-
Kepone	0	-	-	1.9E+02	2.1E+01	-	-	2.2E+03	2.5E+02	2.0E+02	-	4.7E+01	5.4E+00	1.5E+00	-	5.6E+02	6.3E+01	2.0E+01	-	5.6E+02	6.3E+01
Lead	0	-	-	1.0E-01	-	-	-	1.2E+00	-	-	-	2.5E-02	-	-	-	3.0E-01	-	-	-	3.0E-01	-
Malathion	0	-	-	5.0E-01	-	-	-	6.5E+02	-	-	-	5.0E+00	-	-	-	6.5E+01	-	-	-	6.5E+01	-
Manganese	0	-	-	3.0E-02	1.0E+02	-	-	3.5E-01	1.3E+03	-	-	7.5E-03	1.0E+01	-	-	8.9E-02	1.3E+02	-	-	8.9E-02	1.3E+02
Mercury	0	-	-	1.4E+00	7.7E-01	5.0E-02	5.1E-02	9.1E+00	6.5E-04	6.6E-01	3.5E-01	1.9E-01	5.0E-03	5.1E-03	4.1E+00	2.3E+00	6.5E-02	6.5E-02	6.5E-02	6.5E-02	
Methyl Bromide	0	-	-	4.8E+01	4.0E+03	-	-	6.2E+02	5.2E+04	-	-	4.8E+00	4.0E+02	-	-	6.2E+01	5.2E+03	-	-	6.2E+01	5.2E+03
Methoxychlor	0	-	-	3.0E-02	0.0E+00	-	-	0.0E+00	-	-	0.0E+00	-	-	-	0.0E+00	-	-	-	0.0E+00	-	
Mirex	0	-	-	6.8E+02	2.1E+04	-	-	8.8E+03	2.7E+05	-	-	6.8E+01	2.1E+03	-	-	8.8E+02	2.7E+04	-	-	8.8E+02	2.7E+04
Monochlorobenzene	0	-	-	2.5E+02	2.8E+01	6.1E+02	4.6E+03	2.9E+03	3.3E+02	6.0E+04	6.2E+01	6.9E+00	6.1E+01	4.6E+02	7.3E+02	8.1E+01	7.9E+01	8.1E+01	7.9E+01	8.1E+01	
Nickel	0	-	-	1.0E-01	-	-	-	1.2E+00	-	-	-	2.5E+02	-	-	-	1.3E+04	-	-	-	1.3E+04	-
Nitrate (as N)	0	-	-	3.0E-02	1.0E+02	-	-	3.5E-01	1.3E+03	-	-	7.5E-03	1.0E+01	-	-	8.9E-02	1.3E+02	-	-	8.9E-02	1.3E+02
Nitrobenzene	0	-	-	1.7E-01	1.9E+03	-	-	2.2E+02	2.5E+04	-	-	1.7E+00	1.9E+02	-	-	2.2E+01	2.5E+03	-	-	2.2E+01	2.5E+03
N-Nitrosodimethylamine c	0	-	-	6.9E-03	8.1E+01	-	-	1.1E+01	1.3E+03	-	-	6.9E+04	8.1E+00	6.1E+01	4.6E+02	7.3E+02	8.1E+01	7.9E+01	8.1E+01	7.9E+01	
N-Nitrosodiphenylamine c	0	-	-	5.0E-01	1.6E+02	-	-	7.9E+02	2.5E+03	-	-	5.0E+00	1.6E+01	-	-	7.9E+01	2.5E+02	-	-	7.9E+01	2.5E+02
N-Nitrosod-n-propylamine c	0	-	-	5.0E-02	1.4E+01	-	-	7.9E+01	2.2E+02	-	-	5.0E+03	1.4E+00	-	-	7.9E+02	2.2E+01	-	-	7.9E+02	2.2E+01
Parathion	0	-	6.5E-02	1.3E-02	-	-	7.7E-01	1.5E-01	-	-	1.6E-02	3.3E-03	-	-	1.9E-01	3.8E-02	-	-	1.9E-01	3.8E-02	
PCB-1016	0	-	1.4E-02	-	-	-	1.7E-01	-	-	-	3.5E-03	-	-	-	4.1E-02	-	-	-	4.1E-02	-	
PCB-1221	0	-	1.4E-02	-	-	-	1.7E-01	-	-	-	3.5E-03	-	-	-	4.1E-02	-	-	-	4.1E-02	-	
PCB-1232	0	-	1.4E-02	-	-	-	1.7E-01	-	-	-	3.5E-03	-	-	-	4.1E-02	-	-	-	4.1E-02	-	
PCB-1242	0	-	1.4E-02	-	-	-	1.7E-01	-	-	-	3.5E-03	-	-	-	4.1E-02	-	-	-	4.1E-02	-	
PCB-1248	0	-	1.4E-02	-	-	-	1.7E-01	-	-	-	3.5E-03	-	-	-	4.1E-02	-	-	-	4.1E-02	-	
PCB-1254	0	-	1.4E-02	-	-	-	1.7E-01	-	-	-	3.5E-03	-	-	-	4.1E-02	-	-	-	4.1E-02	-	
PCB-1260	0	-	1.4E-02	-	-	-	1.7E-01	-	-	-	3.5E-03	-	-	-	4.1E-02	-	-	-	4.1E-02	-	
PCB Total <sup>c</sup>	0	-	1.7E-03	1.7E-03	-	-	2.7E-02	2.7E-02	-	-	1.7E-04	1.7E-04	-	-	2.7E-03	2.7E-03	-	-	2.7E-03	2.7E-03	

Parameter (ug/l unless noted)	Background Conc.	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations					
		Acute	Chronic	HH (PWs)	HH	Acute	Chronic	HH (PWs)	HH	Acute	Chronic	HH (PWs)	I-H	Acute	Chronic	HH (PWs)	HH	Acute	Chronic	HH (PWs)	HH		
Pentachlorophenol c	0	8.7E+00	6.7E+00	2.8E+00	8.2E+01	1.0E+02	7.9E+01	4.4E+01	1.3E+03	2.2E+00	1.7E+03	2.8E+01	2.0E+01	4.4E+00	2.6E+01	2.0E+01	4.4E+00	2.6E+02	1.3E+02	4.4E+00	1.3E+02		
Phenol	0	-	-	2.1E+04	4.6E+06	-	-	2.7E+05	6.0E+05	1.0E+07	-	-	-	2.1E+03	4.6E+05	-	-	2.7E+04	6.0E+06	-	-		
Pyrene	0	-	-	9.6E+02	1.1E+04	-	-	1.2E+04	1.4E+05	-	-	-	-	9.6E+01	1.1E+03	-	-	1.2E+03	1.4E+04	-	-		
Radiionuclides (pCi/l except Beta/Photon)	0	-	-	-	-	1.5E+01	-	-	-	2.0E+02	2.0E+02	-	-	1.5E+00	1.5E+00	-	-	-	-	-	-		
Gross Alpha Activity (mrem/yr)	0	-	-	4.0E+00	4.0E+00	-	-	5.2E+01	5.2E+01	-	-	4.0E+01	4.0E+01	-	-	5.2E+00	5.2E+00	-	-	5.2E+00	5.2E+00	-	
Selenium-90	0	-	-	8.0E+00	8.0E+00	-	-	1.0E+02	1.0E+02	-	-	8.0E+01	8.0E+01	-	-	1.0E+01	1.0E+01	-	-	1.0E+01	1.0E+01	-	
Strontium-90	0	-	-	2.0E+04	2.0E+04	-	-	2.6E+05	2.6E+05	-	-	2.0E+03	2.0E+03	-	-	2.6E+04	2.6E+04	-	-	2.6E+04	2.6E+04	-	
Tritium	0	-	-	5.0E+00	1.7E+02	1.1E+04	2.4E+02	5.9E+01	1.2E+01	1.3E+00	1.4E+05	5.0E+00	1.3E+00	1.7E+01	1.1E+03	5.9E+01	1.5E+01	5.9E+01	1.5E+01	2.2E+02	1.4E+04	-	
Selenium	0	2.0E+01	5.0E+00	1.7E+02	1.1E+04	-	-	2.2E+03	5.9E+01	1.2E+01	1.3E+00	1.4E+05	5.0E+00	1.3E+00	1.7E+01	1.1E+03	5.9E+01	1.5E+01	5.9E+01	1.5E+01	2.2E+02	1.4E+04	-
Silver	0	6.5E+00	-	-	-	-	-	7.9E+01	-	-	1.6E+00	-	-	-	1.6E+00	-	-	1.9E+01	-	-	-	-	
Sulfate	0	-	-	2.5E+05	-	-	-	3.3E+06	-	-	2.5E+04	-	-	-	1.7E+01	1.1E+01	-	-	3.3E+05	-	-	-	
1,1,2,2-Tetrachloroethane c	0	-	-	1.7E+00	1.1E+02	-	-	2.7E+01	1.7E+03	-	-	1.7E+01	1.1E+01	-	-	2.7E+00	1.7E+02	-	-	2.7E+00	1.7E+02	-	
Tetrachloroethylene c	0	-	-	8.0E+00	6.9E+01	-	-	1.3E+02	1.4E+03	-	-	8.0E+01	6.9E+00	-	-	1.3E+01	1.4E+02	-	-	1.3E+01	1.4E+02	-	
Thallium	0	-	-	1.7E+00	6.3E+00	-	-	2.2E+01	8.2E+01	-	-	1.7E+01	6.3E+01	-	-	2.2E+00	8.2E+00	-	-	2.2E+00	8.2E+00	-	
Toluene	0	-	-	6.8E+03	2.0E+05	-	-	8.8E+04	2.6E+06	-	-	6.8E+02	2.0E+04	-	-	8.8E+03	2.6E+05	-	-	8.8E+03	2.6E+05	-	
Total dissolved solids	0	-	-	5.0E+05	-	-	-	6.5E+06	-	-	5.0E+04	-	-	-	6.5E+05	-	-	6.5E+05	-	-	-		
Toxaphene c	0	7.3E-01	2.0E-04	7.9E-03	7.5E-03	8.9E+00	2.4E-03	1.2E-01	1.2E-01	1.8E-01	5.0E-05	7.3E-04	2.2E+00	5.9E-04	1.2E-02	1.2E-02	2.2E+00	5.9E-04	1.2E-02	1.2E-02	1.2E-02		
Tributyltin	0	4.6E-01	6.3E-02	-	-	5.4E+00	7.4E-01	-	-	1.2E-01	1.6E-02	-	-	1.2E-01	1.6E-02	-	-	1.4E+00	1.9E-01	-	-		
1,2,4-Trichlorobenzene	0	-	-	2.6E+02	9.4E+02	-	-	3.4E+03	1.2E+04	-	-	2.6E+01	9.4E+01	-	-	3.4E+02	1.2E+03	-	-	3.4E+02	1.2E+03	-	
1,1,2-Trichloroethane c	0	-	-	6.0E+00	4.2E+02	-	-	9.5E+01	6.6E+03	-	-	6.0E+01	4.2E+01	-	-	9.5E+00	6.6E+02	-	-	9.5E+00	6.6E+02	-	
Trichloroethylene c	0	-	-	2.7E+01	8.1E+02	-	-	4.3E+02	1.3E+04	-	-	2.7E+00	8.1E+01	-	-	4.3E+01	1.3E+03	-	-	4.3E+01	1.3E+03	-	
2,4,6-Trichlorophenol c	0	-	-	2.1E+01	6.5E+01	-	-	3.3E+02	1.0E+03	-	-	2.1E+00	6.5E+00	-	-	3.3E+01	1.0E+02	-	-	3.3E+01	1.0E+02	-	
2-(2,4,6-Trichlorophenoxy) propanoic acid (Silver)	0	-	-	5.0E+01	-	-	-	6.5E+02	-	-	5.0E+00	-	-	-	6.5E+01	-	-	6.5E+01	-	-	-		
Vinyl Chloride c	0	-	-	2.3E-01	6.1E+01	-	-	3.6E+00	9.6E+02	-	-	2.3E-02	6.1E+00	-	-	3.6E-01	9.6E+01	-	-	3.6E-01	9.6E+01	-	
Zinc	0	1.6E+02	1.6E-02	9.1E+03	6.9E+04	1.9E+03	1.9E+03	1.2E+05	9.0E+05	4.0E+01	4.0E+01	9.1E+02	6.9E+03	4.7E+02	4.7E+02	9.0E+04	4.7E+02	4.7E+02	4.7E+02	4.7E+02			

## Notes:

1. All concentrations expressed as micrograms/liter (ug/l), unless noted otherwise

2. Discharge flow is highest monthly average or Form 2C maximum for industries and design flow for Municipal

3. Metals measured as Dissolved, unless specified otherwise

4. "C" indicates a carcinogenic parameter

5. Regular WLAs are mass balances (minus background concentration) using the % of stream flow entered above under Mixing Information.

Antidegradation WLAs are based upon a complete mix.

6. Antideg. Baseline = (0.25(WQC - background conc.) + background conc.) for acute and chronic

= (0.1(WQC - background conc.) + background conc.) for human health

7. WLAs established at the following stream flows: 1Q10 for Acute, 30Q10 for Chronic Ammonia, 7Q10 for Other Chronic, 30Q5 for Non-carcinogens,

Harmonic Mean for Carcinogens, and Annual Average for Dioxin. Mixing ratios may be substituted for stream flows where appropriate.

Mixing

8. Harmonic Mean for Carcinogens, and Annual Average for Dioxin. Mixing ratios may be substituted for stream flows where appropriate.

Mixing

9. Harmonic Mean for Carcinogens, and Annual Average for Dioxin. Mixing ratios may be substituted for stream flows where appropriate.

Mixing

10. Harmonic Mean for Carcinogens, and Annual Average for Dioxin. Mixing ratios may be substituted for stream flows where appropriate.

Mixing

11. Harmonic Mean for Carcinogens, and Annual Average for Dioxin. Mixing ratios may be substituted for stream flows where appropriate.

Mixing

12. Harmonic Mean for Carcinogens, and Annual Average for Dioxin. Mixing ratios may be substituted for stream flows where appropriate.

Mixing

13. Harmonic Mean for Carcinogens, and Annual Average for Dioxin. Mixing ratios may be substituted for stream flows where appropriate.

Mixing

14. Harmonic Mean for Carcinogens, and Annual Average for Dioxin. Mixing ratios may be substituted for stream flows where appropriate.

Mixing

15. Harmonic Mean for Carcinogens, and Annual Average for Dioxin. Mixing ratios may be substituted for stream flows where appropriate.

Mixing

16. Harmonic Mean for Carcinogens, and Annual Average for Dioxin. Mixing ratios may be substituted for stream flows where appropriate.

Mixing

17. Harmonic Mean for Carcinogens, and Annual Average for Dioxin. Mixing ratios may be substituted for stream flows where appropriate.

Mixing

18. Harmonic Mean for Carcinogens, and Annual Average for Dioxin. Mixing ratios may be substituted for stream flows where appropriate.

Mixing

19. Harmonic Mean for Carcinogens, and Annual Average for Dioxin. Mixing ratios may be substituted for stream flows where appropriate.

Mixing

Metal	Target Value (SSTV)
Antimony	1.8E-01
Arsenic	1.3E-01
Barium	2.6E-03
Cadmium	2.7E-00
Chromium III	1.8E-02
Chromium VI	1.9E-01
Copper	2.2E-01
Iron	3.9E-02
Lead	2.0E-01
Manganese	6.5E-01
Mercury	6.5E-02
Nickel	4.9E-01
Selenium	8.9E-00
Silver	7.6E-00
Zinc	1.9E-02

Note: do not use QL's lower than the minimum QL's provided in agency guidance

## 0.025 MGD DISCHARGE FLOW - STREAM MIX PER "Mix.exe"

Discharge Flow Used for WQS-WLA Calculations (MGD)						0.025	Ammonia - Dry Season - Acute								
Stream Flows		Total Mix Flows				90th Percentile pH (SU)	8.073	Ammonia - Dry Season - Chronic		90th Percentile Temp. (deg C)					
Allocated to Mix (MGD)		Stream + Discharge (MGD)				(pH - 7.204)	-0.869	90th Percentile pH (SU)		8.077					
Dry Season	Wet Season	Dry Season	Wet Season	Dry Season	Wet Season			MIN		1.450					
1Q10 0.270	0.320	0.295	0.345					MAX		25.000					
7Q10 0.270	N/A	N/A	N/A					(7.688 - pH) (pH - 7.688)							
30Q10 0.280	0.340	0.305	0.365												
30Q5 0.300	N/A	N/A	N/A												
Harm. Mean 0.370	N/A	N/A	0.395												
Annual Avg. 0.000	N/A	0.025	N/A												
Stream/Discharge Mix Values						Ammonia - Wet Season - Acute									
Dry Season		Wet Season				90th Percentile pH (SU)	8.089	Ammonia - Wet Season - Chronic		12.797					
25.000		12.849				(7.204 - pH) (pH - 7.204)	-0.885	90th Percentile Temp. (deg C)		8.095					
25.000		12.797					0.885	90th Percentile pH (SU)		2.850					
8.073		8.098						MIN		12.797					
8.077		8.095						MAX		-0.389					
7.000		N/A						(7.688 - pH) (pH - 7.688)		0.389					
7.000		N/A								Early LS Present Criterion (mg N/L)					
Calculated		Formula Inputs								Early LS Absent Criterion (mg N/L)					
144.0		144.0								1.106					
144.0		144.0								Early Life Stages Present?					
144.0		N/A								Y					
1Q10 90th% Temp. Mix (deg C)										Effective Criterion (mg N/L)					
30Q10 90th% Temp. Mix (deg C)										1.106					
1Q10 90th% pH Mix (SU)										Y					
30Q10 90th% pH Mix (SU)										Effective Criterion (mg N/L)					
1Q10 10th% pH Mix (SU)										1.106					
7Q10 10th% pH Mix (SU)										Y					
1Q10 Hardness (mg/L as CaCO3)										Effective Criterion (mg N/L)					
7Q10 Hardness (mg/L as CaCO3)										2.115					

## 0.025 MGD DISCHARGE FLOW - COMPLETE STREAM MIX

Discharge Flow Used for WQS-WLA Calculations (MGD)						0.025	Ammonia - Dry Season - Acute								
100% Stream Flows		Total Mix Flows				90th Percentile pH (SU)	8.073	Ammonia - Dry Season - Chronic		90th Percentile Temp. (deg C)					
Allocated to Mix (MGD)		Stream + Discharge (MGD)				(pH - 7.204)	-0.869	90th Percentile pH (SU)		8.077					
Dry Season	Wet Season	Dry Season	Wet Season	Dry Season	Wet Season			MIN		1.450					
1Q10 0.270	0.320	0.295	0.345					MAX		25.000					
7Q10 0.270	N/A	N/A	N/A					(7.688 - pH) (pH - 7.688)							
30Q10 0.280	0.340	0.305	0.365												
30Q5 0.300	N/A	N/A	0.325												
Harm. Mean 0.370	N/A	N/A	0.395												
Annual Avg. 0.000	N/A	0.025	N/A												
Stream/Discharge Mix Values						Ammonia - Wet Season - Acute									
Dry Season		Wet Season				90th Percentile pH (SU)	8.089	Ammonia - Wet Season - Chronic		12.797					
25.000		12.849				(7.204 - pH) (pH - 7.204)	-0.885	90th Percentile Temp. (deg C)		8.095					
25.000		12.797					0.885	90th Percentile pH (SU)		2.850					
8.073		8.098						MIN		12.797					
8.077		8.095						MAX		-0.389					
7.000		N/A						(7.688 - pH) (pH - 7.688)		0.389					
7.000		N/A								Early LS Present Criterion (mg N/L)					
Calculated		Formula Inputs								Early LS Absent Criterion (mg N/L)					
144.0		144.000								1.106					
144.0		N/A								Early Life Stages Present?					
144.0		N/A								Y					
1Q10 90th% Temp. Mix (deg C)										Effective Criterion (mg N/L)					
30Q10 90th% Temp. Mix (deg C)										1.106					
1Q10 90th% pH Mix (SU)										Y					
30Q10 90th% pH Mix (SU)										Effective Criterion (mg N/L)					
1Q10 10th% pH Mix (SU)										1.106					
7Q10 10th% pH Mix (SU)										Y					
1Q10 Hardness (mg/L as CaCO3)										Effective Criterion (mg N/L)					
7Q10 Hardness (mg/L as CaCO3)										2.115					

3/11/2008 8:58:18 AM

Facility = Woodhaven Nursing Home WWTP  
Chemical = ammonia as N (mg/L) (0.025 MGD)  
Chronic averaging period = 30  
WLAa = 22  
WLAc = 3.4  
Q.L. = 0.2  
# samples/mo. = 1  
# samples/wk. = 1

Summary of Statistics:

# observations = 1  
Expected Value = 9  
Variance = 29.16  
C.V. = 0.6  
97th percentile daily values = 21.9007  
97th percentile 4 day average = 14.9741  
97th percentile 30 day average= 10.8544  
# < Q.L. = 0  
Model used = BPJ Assumptions, type 2 data

A limit is needed based on Chronic Toxicity  
Maximum Daily Limit = 6.86007831761546  
Average Weekly limit = 6.86007831761546  
Average Monthly LImit = 6.86007831761546

The data are:

1/29/2008 1:38:24 PM

Facility = Woodhaven Nursing Home WWTP  
Chemical = TRC (ug/L) 0.025 MGD  
Chronic averaging period = 4  
WLAa = 56  
WLAc = 32  
Q.L. = 100  
# samples/mo. = 30  
# samples/wk. = 8

Summary of Statistics:

# observations = 1  
Expected Value = 1000  
Variance = 360000  
C.V. = 0.6  
97th percentile daily values = 2433.41  
97th percentile 4 day average = 1663.79  
97th percentile 30 day average= 1206.05  
# < Q.L. = 0  
Model used = BPJ Assumptions, type 2 data

A limit is needed based on Chronic Toxicity  
Maximum Daily Limit = 46.8023930897034  
Average Weekly limit = 27.9178655104031  
Average Monthly LImit = 23.1962565349114

The data are:

1000

**Attachment I**

**Public Notice**

PUBLIC NOTICE – Environmental Permit

**PURPOSE OF NOTICE:** To seek public comment on a draft permit from the Department of Environmental Quality that will allow the release of treated wastewater into a water body in Bedford County.

**PUBLIC COMMENT PERIOD:** 30 days following the public notice issue date; comment period ends 4:30 pm of last day

**PERMIT NAME:** Virginia Pollutant Discharge Elimination System – Wastewater issued by DEQ, under the authority of the State Water Control Board

**NAME, ADDRESS, AND PERMIT NUMBER OF APPLICANT:** Family Health Initiatives, Inc., PO. Box 168 Montvale, Virginia 24122

**NAME AND ADDRESS OF FACILITY:** Woodhaven Nursing Home WWTP, 13055 West Lynchburg-Salem Turnpike, Montvale, Virginia 24122

**PROJECT DESCRIPTION:** Family Health Initiative, Inc. has applied for a reissuance of a permit for the wastewater treatment plant in Bedford County. The applicant proposes to release treated sewage at a rate of 0.0048 MGD from the current facility into a water body. The owner has also applied to release treated sewage at a rate of 0.0066 MGD and 0.025 MGD from a proposed upgraded facility. Septage from the treatment process will be disposed of at a wastewater treatment plant. The facility proposes to release the treated sewage into an unnamed tributary to the South Fork of Goose Creek in Bedford County in the Upper Goose Creek Watershed (VAW-L20R). A watershed is the land area drained by a river and its incoming streams. The permit will limit the following pollutants to amounts that protect water quality: nutrients, organic matter, solids.

**HOW TO COMMENT:** DEQ accepts comments by e-mail, fax, or postal mail. All comments must be in writing and be received by DEQ during the comment period. The public also may request a public hearing.

**WRITTEN COMMENTS MUST INCLUDE:** DEQ accepts comments by e-mail, fax, or postal mail. All comments must be in writing and be received by DEQ during the comment period. Written comments must include: 1) The names, mailing addresses, and telephone numbers of the person commenting and of all people represented by the citizen. 2) If a public hearing is requested, the reason for holding a hearing, including associated concerns. 3) A brief, informal statement regarding the extent of the interest of the person commenting, including how the operation of the facility or activity affects the citizen. DEQ may hold a public hearing, including another comment period, if a public response is significant and there are substantial, disputed issues relevant to the proposed permit. The public may review the draft permit and application at the DEQ office named below.

**CONTACT OF PUBLIC COMMENTS, DOCUMENT REQUESTS, AND ADDITIONAL INFORMATION:**

**NAME:** Becky L. France; **ADDRESS:** Virginia Department of Environmental Quality, West Central Regional Office, 3019 Peters Creek Road, Roanoke, VA 24019-2738; **PHONE:** (540) 562-6700; **E-MAIL ADDRESS:** [blfrance@deq.virginia.gov](mailto:blfrance@deq.virginia.gov); **FAX:** (540) 562-6860

**Attachment J**

**EPA Checksheet**

Revised 2/2003

**State "FY2003 Transmittal Checklist" to Assist in Targeting  
Municipal and Industrial Individual NPDES Draft Permits for Review**

**Part I. State Draft Permit Submission Checklist**

In accordance with the MOA established between the Commonwealth of Virginia and the United States Environmental Protection Agency, Region III, the Commonwealth submits the following draft National Pollutant Discharge Elimination System (NPDES) permit for Agency review and concurrence.

Facility Name: Woodhaven Nursing Home WWTP  
NPDES Permit Number: VA0074870  
Permit Writer Name: Becky L. France  
Date: 1/29/08

**Major [ ]      Minor [X]      Industrial [ ]      Municipal [X]**

<b>I.A. Draft Permit Package Submittal Includes:</b>		
	<b>Yes</b>	<b>No</b>
	<b>N/A</b>	
1. Permit Application?	X	
2. Complete Draft Permit (for renewal or first time permit – entire permit, including boilerplate information)?	X	
3. Copy of Public Notice?	X	
4. Complete Fact Sheet?	X	
5. A Priority Pollutant Screening to determine parameters of concern?		X
6. A Reasonable Potential analysis showing calculated WQBELs?	X	
7. Dissolved Oxygen calculations?	X	
8. Whole Effluent Toxicity Test summary and analysis?		X
9. Permit Rating Sheet for new or modified industrial facilities?		X

<b>I.B. Permit/Facility Characteristics</b>		
	<b>Yes</b>	<b>No</b>
	<b>N/A</b>	
1. Is this a new, or currently unpermitted facility?		X
2. Are all permissible outfalls (including combined sewer overflow points, non-process water and storm water) from the facility properly identified and authorized in the permit?	X	
3. Does the fact sheet or permit contain a description of the wastewater treatment process?	X	

I.B. Permit/Facility Characteristics – cont. (FY2003)	Yes	No	N/A
4. Does the review of PCS/DMR data for at least the last 3 years indicate significant non-compliance with the existing permit?		X	
5. Has there been any change in streamflow characteristics since the last permit was developed?	X		
6. Does the permit allow the discharge of new or increased loadings of any pollutants?		X	
7. Does the fact sheet or permit provide a description of the receiving water body(s) to which the facility discharges, including information on low/critical flow conditions and designated/existing uses?	X		
8. Does the facility discharge to a 303(d) listed water?		X	
a. Has a TMDL been developed and approved by EPA for the impaired water?		X	
b. Does the record indicate that the TMDL development is on the State priority list and will most likely be developed within the life of the permit?			X
c. Does the facility discharge a pollutant of concern identified in the TMDL or 303(d) listed water?			X
9. Have any limits been removed, or are any limits less stringent, than those in the current permit? Due to new information – increase in low flow in stream	X		
10. Does the permit authorize discharges of storm water?			X
11. Has the facility substantially enlarged or altered its operation or substantially increased its flow or production?		X	
12. Are there any production-based, technology-based effluent limits in the permit?		X	
13. Do any water quality-based effluent limit calculations differ from the State's standard policies or procedures?		X	
14. Are any WQBELs based on an interpretation of narrative criteria?		X	
15. Does the permit incorporate any variances or other exceptions to the State's standards or regulations?		X	
16. Does the permit contain a compliance schedule for any limit or condition?	X		
17. Is there a potential impact to endangered/threatened species or their habitat by the facility's discharge(s)?		X	
18. Have impacts from the discharge(s) at downstream potable water supplies been evaluated?			X
19. Is there any indication that there is significant public interest in the permit action proposed for this facility?		X	
20. Have previous permit, application, and fact sheet been examined?	X		

## Part II. NPDES Draft Permit Checklist (FY2003)

### Region III NPDES Permit Quality Checklist – for POTWs (To be completed and included in the record only for POTWs)

II.A. Permit Cover Page/Administration		
	Yes	No
1. Does the fact sheet or permit describe the physical location of the facility, including latitude and longitude (not necessarily on permit cover page)?	X	
2. Does the permit contain specific authorization-to-discharge information (from where to where, by whom)?	X	

II.B. Effluent Limits – General Elements		
	Yes	No
1. Does the fact sheet describe the basis of final limits in the permit (e.g., that a comparison of technology and water quality-based limits was performed, and the most stringent limit selected)?	X	
2. Does the fact sheet discuss whether "antibacksliding" provisions were met for any limits that are less stringent than those in the previous NPDES permit?	X	

II.C. Technology-Based Effluent Limits (POTWs)		
	Yes	No
1. Does the permit contain numeric limits for <u>ALL</u> of the following: BOD (or alternative, e.g., CBOD, COD, TOC), TSS, and pH?	X	
2. Does the permit require at least 85% removal for BOD (or BOD alternative) and TSS (or 65% for equivalent to secondary) consistent with 40 CFR Part 133?	X	
a. If no, does the record indicate that application of WQBELs, or some other means, results in more stringent requirements than 85% removal or that an exception consistent with 40 CFR 133.103 has been approved?		X
3. Are technology-based permit limits expressed in the appropriate units of measure (e.g., concentration, mass, SU)?	X	
4. Are permit limits for BOD and TSS expressed in terms of both long term (e.g., average monthly) and short term (e.g., average weekly) limits?	X	
5. Are any concentration limitations in the permit less stringent than the secondary treatment requirements (30 mg/l BOD5 and TSS for a 30-day average and 45 mg/l BOD5 and TSS for a 7-day average)?		X
a. If yes, does the record provide a justification (e.g., waste stabilization pond, trickling filter, etc.) for the alternate limitations?		X

II.D. Water Quality-Based Effluent Limits		
	Yes	No
1. Does the permit include appropriate limitations consistent with 40 CFR 122.44(d) covering State narrative and numeric criteria for water quality?	X	
2. Does the fact sheet indicate that any WQBELs were derived from a completed and EPA approved TMDL?		X

II.D. Water Quality-Based Effluent Limits – cont. (FY2003)	Yes	No	N/A
3. Does the fact sheet provide effluent characteristics for each outfall?	X		
4. Does the fact sheet document that a "reasonable potential" evaluation was performed?	X		
a. If yes, does the fact sheet indicate that the "reasonable potential" evaluation was performed in accordance with the State's approved procedures?	X		
b. Does the fact sheet describe the basis for allowing or disallowing in-stream dilution or a mixing zone?	X		
c. Does the fact sheet present WLA calculation procedures for all pollutants that were found to have "reasonable potential"?	X		
d. Does the fact sheet indicate that the "reasonable potential" and WLA calculations accounted for contributions from upstream sources (i.e., do calculations include ambient/background concentrations)?			X
e. Does the permit contain numeric effluent limits for all pollutants for which "reasonable potential" was determined?	X		
5. Are all final WQBELs in the permit consistent with the justification and/or documentation provided in the fact sheet?	X		
6. For all final WQBELs, are BOTH long-term AND short-term effluent limits established?	X		
7. Are WQBELs expressed in the permit using appropriate units of measure (e.g., mass, concentration)?	X		
8. Does the record indicate that an "antidegradation" review was performed in accordance with the State's approved antidegradation policy?	X		

II.E. Monitoring and Reporting Requirements	Yes	No	N/A
1. Does the permit require at least annual monitoring for all limited parameters and other monitoring as required by State and Federal regulations?	X		
a. If no, does the fact sheet indicate that the facility applied for and was granted a monitoring waiver, AND, does the permit specifically incorporate this waiver?			X
2. Does the permit identify the physical location where monitoring is to be performed for each outfall?	X		
3. Does the permit require at least annual influent monitoring for BOD (or BOD alternative) and TSS to assess compliance with applicable percent removal requirements?		X	
4. Does the permit require testing for Whole Effluent Toxicity?		X	

II.F. Special Conditions	Yes	No	N/A
1. Does the permit include appropriate biosolids use/disposal requirements?	X		
2. Does the permit include appropriate storm water program requirements?			X

**II.F. Special Conditions – cont. (FY2003)**

	<b>Yes</b>	<b>No</b>	<b>N/A</b>
3. If the permit contains compliance schedule(s), are they consistent with statutory and regulatory deadlines and requirements?			X
4. Are other special conditions (e.g., ambient sampling, mixing studies, TIE/TRE, BMPs, special studies) consistent with CWA and NPDES regulations?	X		
5. Does the permit allow/authorize discharge of sanitary sewage from points other than the POTW outfall(s) or CSO outfalls [i.e., Sanitary Sewer Overflows (SSOs) or treatment plant bypasses]?			X
6. Does the permit authorize discharges from Combined Sewer Overflows (CSOs)?			X
a. Does the permit require implementation of the "Nine Minimum Controls"?			X
b. Does the permit require development and implementation of a "Long Term Control Plan"?			X
c. Does the permit require monitoring and reporting for CSO events?			X
7. Does the permit include appropriate Pretreatment Program requirements?			X

**II.G. Standard Conditions**

	<b>Yes</b>	<b>No</b>	<b>N/A</b>
1. Does the permit contain all 40 CFR 122.41 standard conditions or the State equivalent (or more stringent) conditions?	X		

**List of Standard Conditions – 40 CFR 122.41**

Duty to comply	Property rights	Reporting Requirements
Duty to reapply	Duty to provide information	Planned change
Need to halt or reduce activity not a defense	Inspections and entry	Anticipated noncompliance
Duty to mitigate	Monitoring and records	Transfers
Proper O & M	Signatory requirement	Monitoring reports
Permit actions	Bypass	Compliance schedules
	Upset	24-Hour reporting
		Other non-compliance

2. Does the permit contain the additional standard condition (or the State equivalent or more stringent conditions) for POTWs regarding notification of new introduction of pollutants and new industrial users [40 CFR 122.42(b)]?

	X	
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## Part II. NPDES Draft Permit Checklist (FY2003)

### Region III NPDES Permit Quality Review Checklist – For Non-Municipals *(To be completed and included in the record for all non-POTWs)*

II.A. Permit Cover Page/Administration		
	Yes	No
1. Does the fact sheet or permit describe the physical location of the facility, including latitude and longitude (not necessarily on permit cover page)?		
2. Does the permit contain specific authorization-to-discharge information (from where to where, by whom)?		
II.B. Effluent Limits – General Elements		
1. Does the fact sheet describe the basis of final limits in the permit (e.g., that a comparison of technology and water quality-based limits was performed, and the most stringent limit selected)?		
2. Does the fact sheet discuss whether "antibacksliding" provisions were met for any limits that are less stringent than those in the previous NPDES permit?		
II.C. Technology-Based Effluent Limits (Effluent Guidelines & BPJ)		
1. Is the facility subject to a national effluent limitations guideline (ELG)?		
a. If yes, does the record adequately document the categorization process, including an evaluation of whether the facility is a new source or an existing source?		
b. If no, does the record indicate that a technology-based analysis based on Best Professional Judgement (BPJ) was used for all pollutants of concern discharged at treatable concentrations?		
2. For all limits developed based on BPJ, does the record indicate that the limits are consistent with the criteria established at 40 CFR 125.3(d)?		
3. Does the fact sheet adequately document the calculations used to develop both ELG and /or BPJ technology-based effluent limits?		
4. For all limits that are based on production or flow, does the record indicate that the calculations are based on a "reasonable measure of ACTUAL production" for the facility (not design)?		
5. Does the permit contain "tiered" limits that reflect projected increases in production or flow?		
a. If yes, does the permit require the facility to notify the permitting authority when alternate levels of production or flow are attained?		
6. Are technology-based permit limits expressed in appropriate units of measure (e.g., concentration, mass, SU)?		

II.C. Technology-Based Effluent Limits (Effluent Guidelines & BPJ) – cont.	Yes	No	N/A
7. Are all technology-based limits expressed in terms of both maximum daily, weekly average, and/or monthly average limits?			
8. Are any final limits less stringent than required by applicable effluent limitations guidelines or BPJ?			

II.D. Water Quality-Based Effluent Limits	Yes	No	N/A
1. Does the permit include appropriate limitations consistent with 40 CFR 122.44(d) covering State narrative and numeric criteria for water quality?			
2. Does the record indicate that any WQBELs were derived from a completed and EPA approved TMDL?			
3. Does the fact sheet provide effluent characteristics for each outfall?			
4. Does the fact sheet document that a "reasonable potential" evaluation was performed?			
a. If yes, does the fact sheet indicate that the "reasonable potential" evaluation was performed in accordance with the State's approved procedures?			
b. Does the fact sheet describe the basis for allowing or disallowing in-stream dilution or a mixing zone?			
c. Does the fact sheet present WLA calculation procedures for all pollutants that were found to have "reasonable potential"?			
d. Does the fact sheet indicate that the "reasonable potential" and WLA calculations accounted for contributions from upstream sources (i.e., do calculations include ambient/background concentrations where data are available)?			
e. Does the permit contain numeric effluent limits for all pollutants for which "reasonable potential" was determined?			
5. Are all final WQBELs in the permit consistent with the justification and/or documentation provided in the fact sheet?			
6. For all final WQBELs, are BOTH long-term (e.g., average monthly) AND short-term (e.g., maximum daily, weekly average, instantaneous) effluent limits established?			
7. Are WQBELs expressed in the permit using appropriate units of measure (e.g., mass, concentration)?			
8. Does the fact sheet indicate that an "antidegradation" review was performed in accordance with the State's approved antidegradation policy?			

FY2003

II.E. Monitoring and Reporting Requirements (FY2003)	Yes	No	N/A
1. Does the permit require at least annual monitoring for all limited parameters?			
a. If no, does the fact sheet indicate that the facility applied for and was granted a monitoring waiver, AND, does the permit specifically incorporate this waiver?			
2. Does the permit identify the physical location where monitoring is to be performed for each outfall?			
3. Does the permit require testing for Whole Effluent Toxicity in accordance with the State's standard practices?			

II.F. Special Conditions	Yes	No	N/A
1. Does the permit require development and implementation of a Best Management Practices (BMP) plan or site-specific BMPs?			
a. If yes, does the permit adequately incorporate and require compliance with the BMPs?			
2. If the permit contains compliance schedule(s), are they consistent with statutory and regulatory deadlines and requirements?			
3. Are other special conditions (e.g., ambient sampling, mixing studies, TIE/TRE, BMPs, special studies) consistent with CWA and NPDES regulations?			

II.G. Standard Conditions	Yes	No	N/A
1. Does the permit contain all 40 CFR 122.41 standard conditions or the State equivalent (or more stringent) conditions?			
<b>List of Standard Conditions – 40 CFR 122.41</b>			
Duty to comply	Property rights	Reporting Requirements	
Duty to reapply	Duty to provide information	Planned change	
Need to halt or reduce activity not a defense	Inspections and entry	Anticipated noncompliance	
Duty to mitigate	Monitoring and records	Transfers	
Proper O & M	Signatory requirement	Monitoring reports	
Permit actions	Bypass	Compliance schedules	
	Upset	24-Hour reporting	
		Other non-compliance	
2. Does the permit contain the additional standard condition (or the State equivalent or more stringent conditions) for existing non-municipal dischargers regarding pollutant notification levels [40 CFR 122.42(a)]?			

### **Part III. Signature Page (FY2003)**

Based on a review of the data and other information submitted by the permit applicant, and the draft permit and other administrative records generated by the Department/Division and/or made available to the Department/Division, the information provided on this checklist is accurate and complete, to the best of my knowledge.

Name	<u>Becky L. France</u>
Title	<u>Environmental Engineer Senior</u>
Signature	<u>Becky L. France</u>
Date	<u>1/29/08</u>